Name ANSWER KEY Date HANJE Class GEOMETRY B

EXAM G.B

Geometry B: Final Exam Review

Modules 11 - 19

Section 11.1 – Dilations

Apply the dilation.

1. D: $(x, y) \rightarrow (2x, -2y)$ G(1, −2), H(1, −4), K(4, −2).

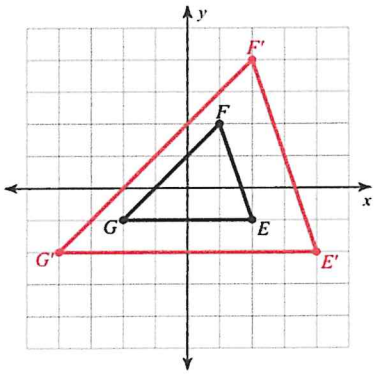
G′ (2 , 4), H′ (2 , 8), K′ (8 , 4)

2. D: $(x, y) \rightarrow \left(\frac{1}{3}x, \frac{1}{3}y\right)$ L(−3, 3), M(3, 6), N(9, −12)

L′ (-1 , 1), M′ (1 , 2), N′ (3 , -4)

Determine if the following are dilations. If so, what is the scale factor of the dilation?

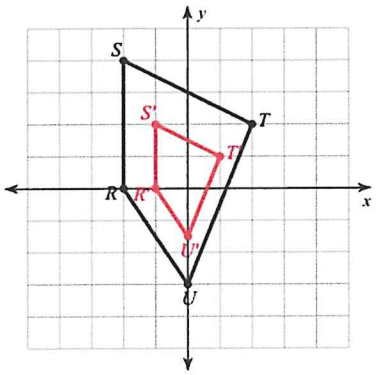
3.



DILATION

SF = 2

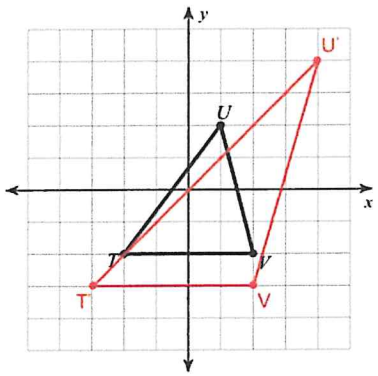
4.



DILATION

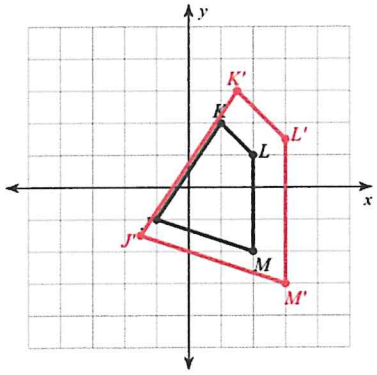
SF = 0.5

5.



NOT A DILATION

6.



DILATION

SF = 1.5

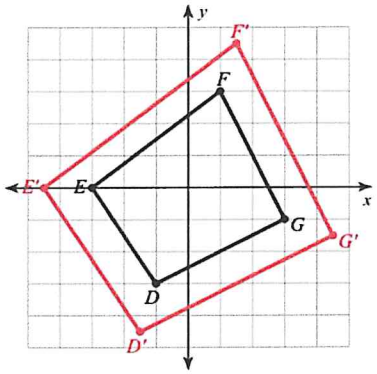
Section 11.2 – Proving Figures are Similar with Transformations

1. Which of the following isn't preserved after a dilation?

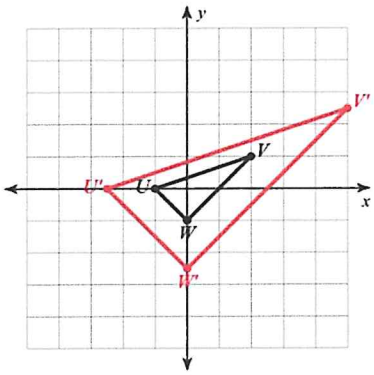
BETWEENESS ANGLE MEASURES **SIDE LENGTHS** ORIENTATION

2. Are all circles similar? **YES** or NO

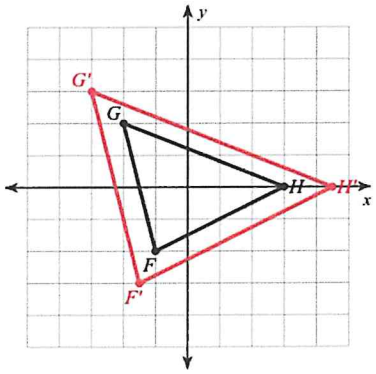
Given the figures are similar, determine what the scale factor of the dilation is.

3. 

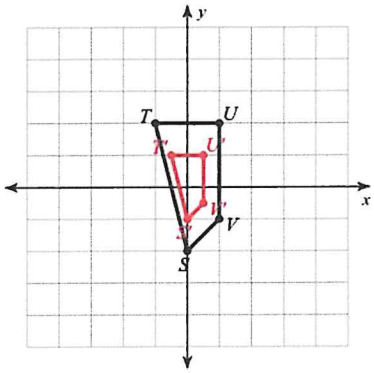
SF = 1.5

4. 

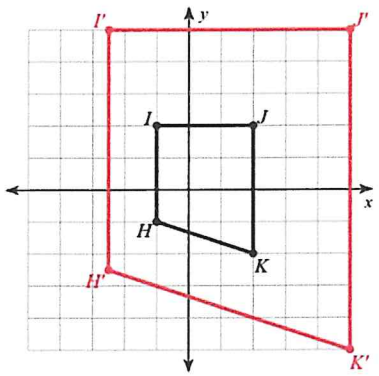
SF = 2.5

5. 

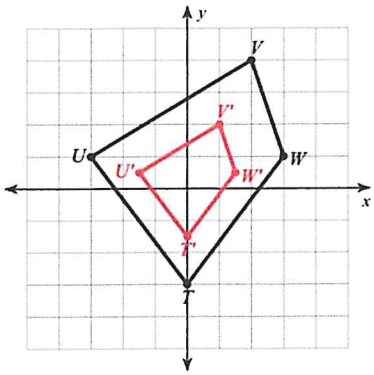
SF = 1.5

6. 

SF = 0.5

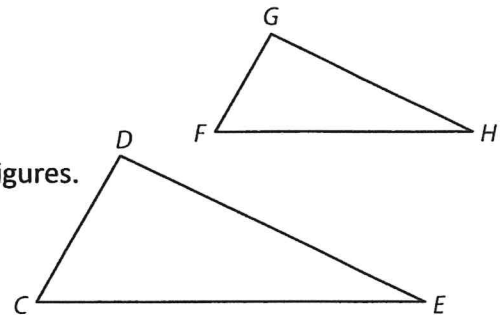
7. 

SF = 2.5

8. 

SF = 0.5

Section 11.3 – Corresponding Parts of Similar Figures

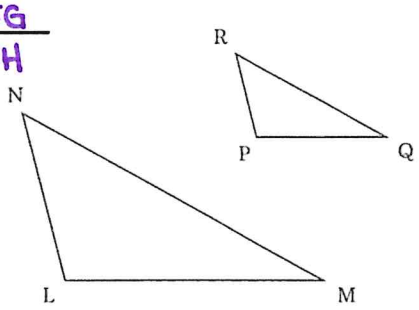


1. Fill in the blanks to complete the statements about similar figures.

$\Delta CDE \sim \Delta FGH$

$m\angle C = m\angle$ F $\quad m\angle D = m\angle$ G $\quad m\angle E = m\angle$ H

$\frac{CD}{FG} = \frac{DE}{GH} \quad \frac{CE}{FH} = \frac{ED}{HG} \quad \frac{CD}{CE} = \frac{FG}{FH}$



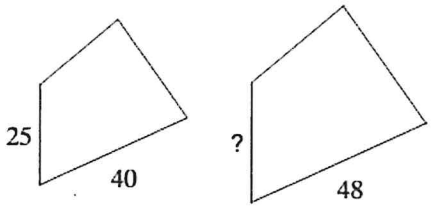
2. Fill in the blanks to complete the statements about similar figures.

$\Delta NLM \sim \Delta RPQ$

$\frac{NM}{RQ} = \frac{NL}{RP} \quad \frac{ML}{QP} = \frac{MN}{QR} \quad \frac{LM}{PQ} = \frac{LN}{PR}$

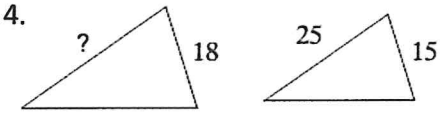
Given the shapes are similar find the measure of the missing side length or the value of x.

3.



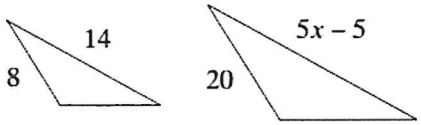
X = 30

4.



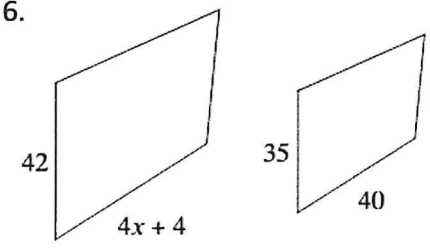
X = 30

5.



X = 8

6.

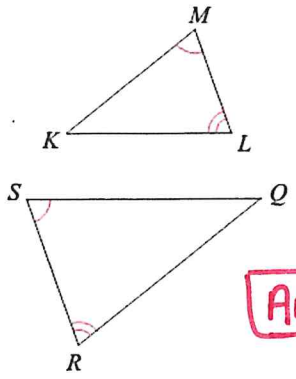


X = 11

Section 11.4 – AA Similarity of Triangles

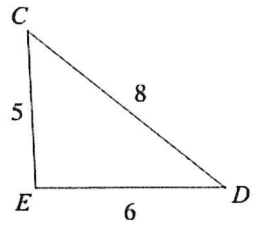
Determine if the triangles are similar using AA~, SSS~, or SAS~

1. $\triangle SRQ \sim \triangle MLK$

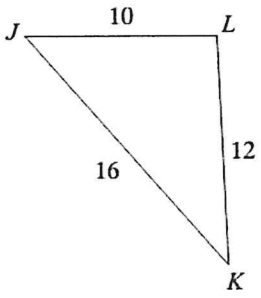


AA ~

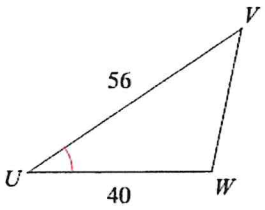
2. $\triangle JKL \sim \triangle CDE$



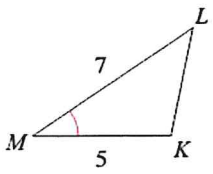
SSS ~



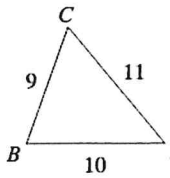
3. $\triangle UVW \sim \triangle MLK$



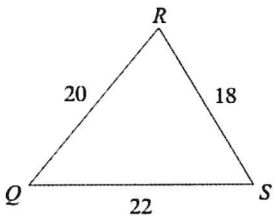
SAS ~



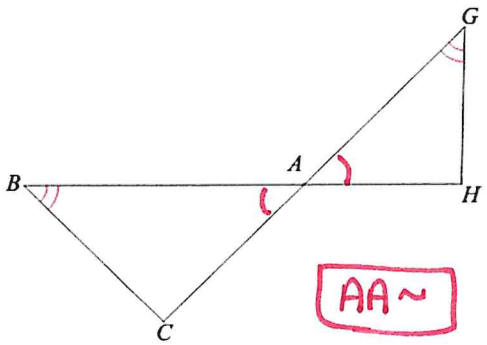
4. $\triangle QRS \sim \triangle ABC$



SSS ~

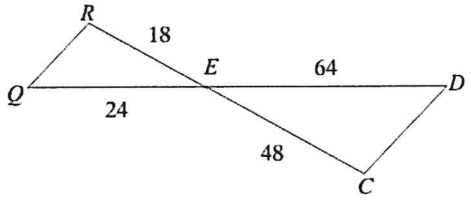


5. $\triangle ABC \sim \triangle AGH$



AA ~

6. $\triangle EDC \sim \triangle EQR$

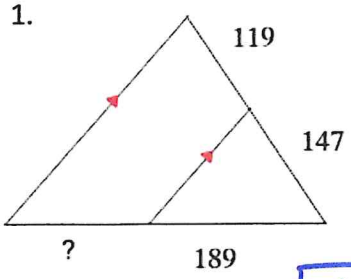


SAS ~

Section 12.1 – Triangle Proportionality Theorem

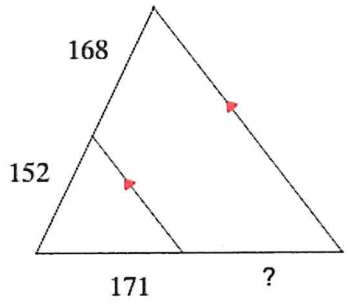
Use the Triangle Proportionality Theorem to find the length of each segment.

1.



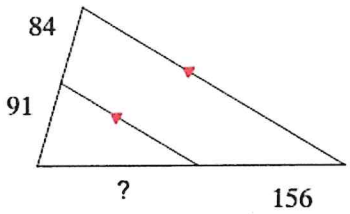
X = 153

2.



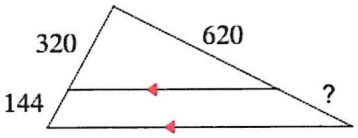
X = 189

3.



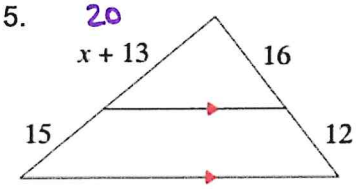
X = 169

4.



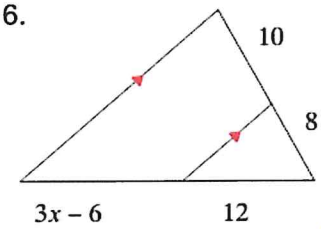
X = 279

5. 20



X = 7

6.

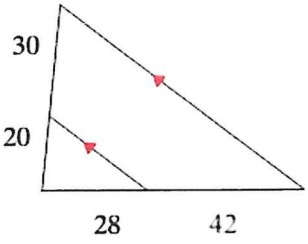


15

X = 7

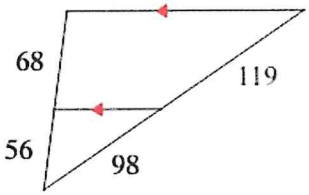
Verify if the line segments are parallel

7.



YES

8.



YES

Section 12.2 – Subdividing a Segment in a Given Ratio

Find the coordinates of the point P that divides the line segment AB in the given ratio.

1. A(−9, −1), B(11, 9); 3 to 2

(3,5)

2. A(−1, 9), B(23, −7); 7 to 1

(20, -5)

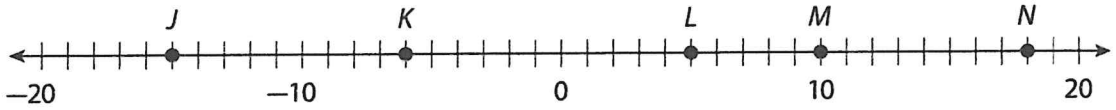
3. A(−7, 12), B(9, 0); 1 to 3

(-3, 9)

4. A(7,−4), B(−7, 3); 3 to 4

(1, -1)

Find the coordinate of the point P that divides each directed line segment in the given ratio.



5. from J to M; 2 to 3

-5

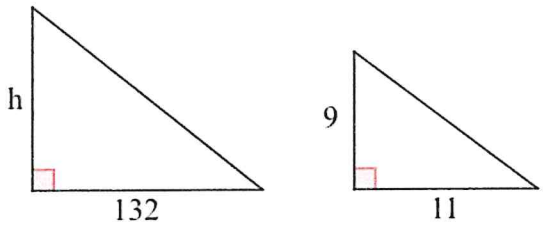
6. from K to N; 5 to 1

14

Section 12.3 – Using Proportional Relationships

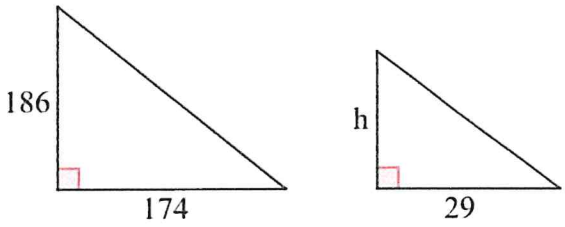
Using similar triangles. Find the height for the following problems

1.



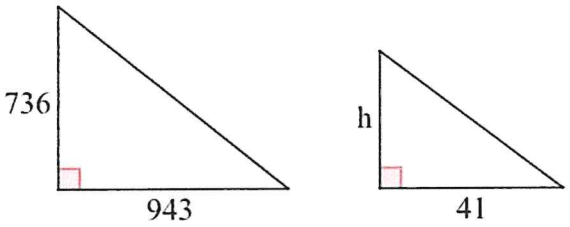
h = 108

2.



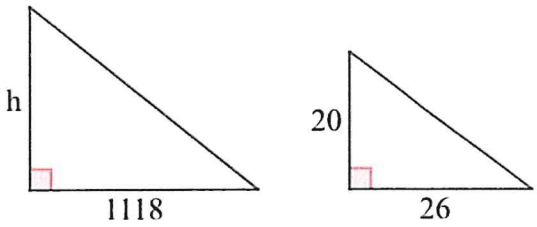
h = 31

3.



h = 32

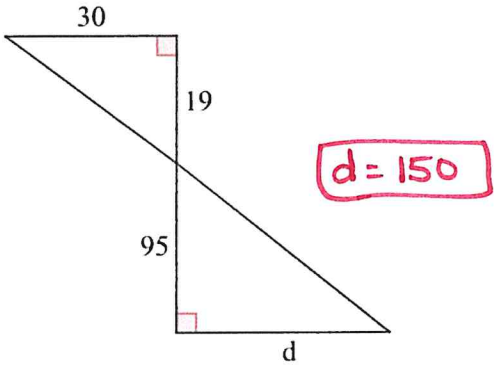
4.



h = 860

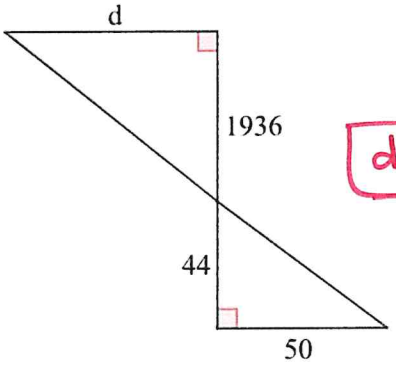
Using similar triangles. Find the distance for the following problems

5.



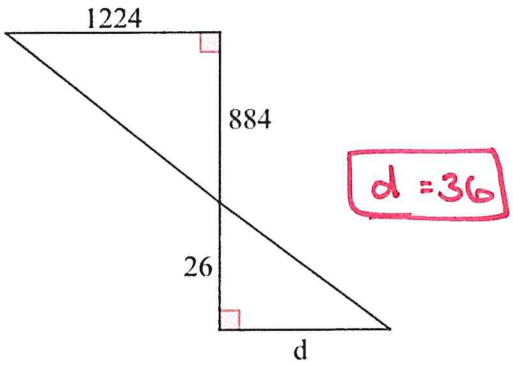
d = 150

6.



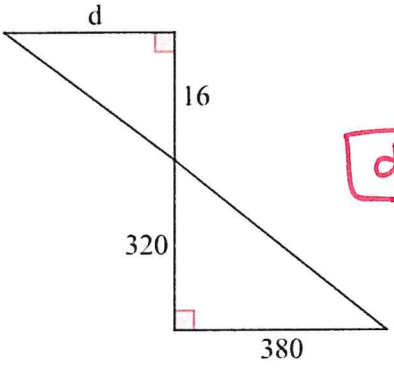
d = 2200

7.



d = 36

8.



d = 19

Section 12.4 – Similarity in Right Triangles

Find the Geometric Means of the following two numbers. Simplify, if necessary.

1. **5** and **80**

20

2. **169** and **64**

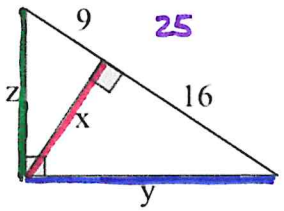
104

3. **3** and **75**

15

Use the Geometric Means Theorems to the following values. Simplify, if necessary.

3.

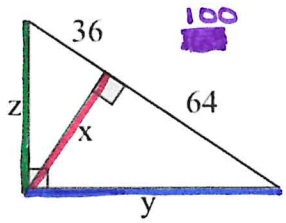


X = 12

Y = 20

Z = 15

4.

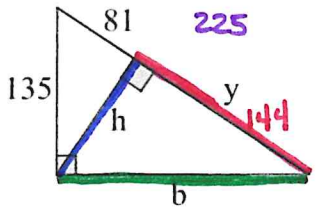


X = 48

Y = 80

Z = 60

5.



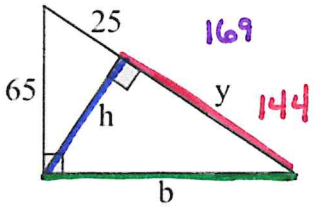
$135 = \sqrt{81 \cdot (81 + y)}$

144 = y

h = 108

b = 180

6.



144 = y

h = 60

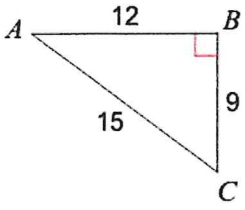
b = 156

Section 13.1 – Tangent Ratio

TOA

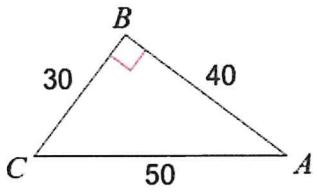
$$tangent = \frac{\text{OPPOSITE}}{\text{ADJACENT}}$$

Find the tangent ratio of each specified angle. Write each ratio as a fraction and decimal rounded to the nearest hundredth.

1. 

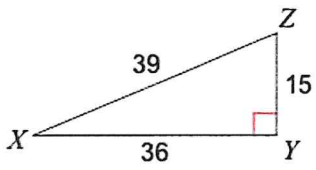
$\angle A$ $\frac{9}{12} = 0.75$

$\angle C$ $\frac{12}{9} = 1.33$

2. 

$\angle C$ $\frac{40}{30} = 1.33$

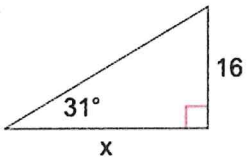
$\angle A$ $\frac{30}{40} = 0.75$

3. 

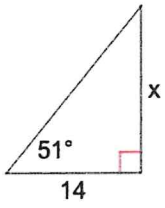
$\angle X$ $\frac{15}{36} = 0.4167$

$\angle Z$ $\frac{36}{15} = 2.4$

Apply the tangent ratio to find unknown lengths

4. 

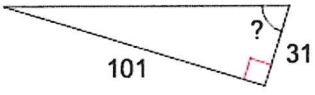
X = 26.6

5. 

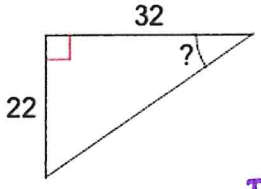
X = 17.3

Apply the tangent ratio to find unknown lengths

TOA

6. 

73°

7. 

35°

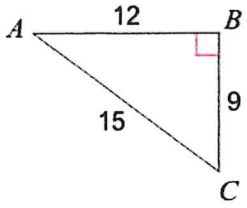
Section 13.2 – Sine & Cosine Ratio

SOH CAH

$sine = \frac{\text{OPPOSITE}}{\text{HYPOTENUSE}}$

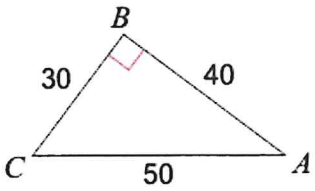
$cosine = \frac{\text{ADJACENT}}{\text{HYPOTENUSE}}$

Find the sine & cosine ratio of each specified angle. Write each ratio as a fraction and round to 2 decimal places.

1. 

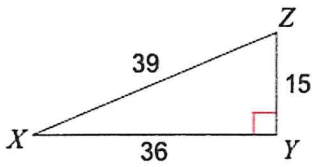
$\sin A$ $\frac{9}{15} = 0.6$

$\cos A$ $\frac{12}{15} = 0.8$

2. 

$\sin C$ $\frac{40}{50} = 0.8$

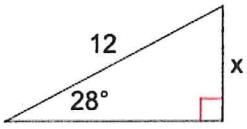
$\cos C$ $\frac{30}{50} = 0.6$

3. 

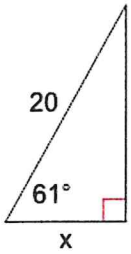
$\sin X$ $\frac{15}{39} = 0.385$

$\cos X$ $\frac{36}{39} = 0.923$

Apply the sine and cosine ratio to find unknown lengths

4. 

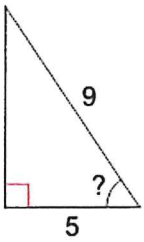
X=5.6

5. 

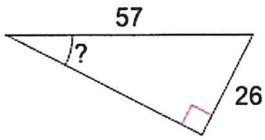
X=9.7

Apply the sine and cosine ratio to find unknown lengths

SOH CAH

6. 

56°

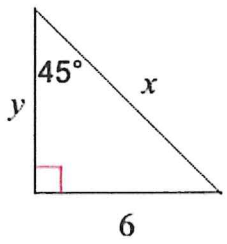
7. 

27°

Section 13.3 – Special Right Triangles

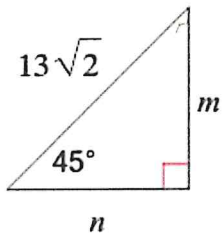
Use properties of special right triangles (30-60-90 & 45-45-90) to find the unknown lengths.

1.



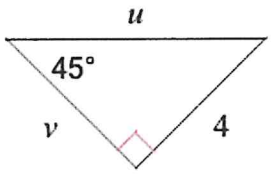
Y=6 X = 6√2

2.



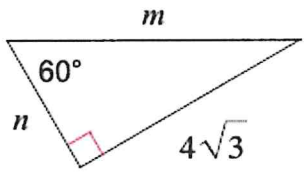
n = 13 m = 13

3.



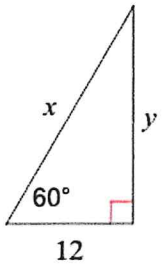
V=4 u = 4√2

4.



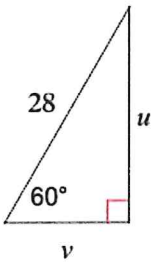
n=4 m=8

5.



X=24 Y = 12√3

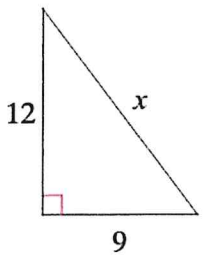
6.



V=14 u = 14√3

Use the Pythagorean Theorem and Pythagorean Triples to find a missing side length.

7.



X = 15

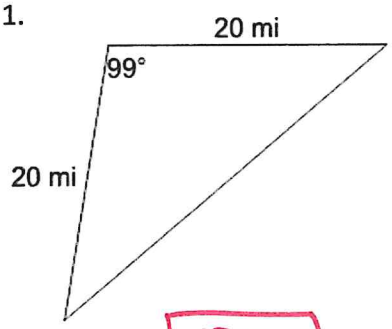
Determine if the following are a Pythagorean Triple. (Yes or No)

8. 8, 15, 17 YES
9. 63, 120, 136 NO
10. 99, 132, 165 YES
11. 65, 156, 169 YES

Section 13.4 – Problem Solving with Trigonometry

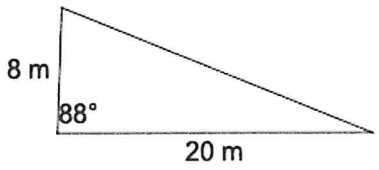
Find the area of each triangle to the nearest tenth.

1.



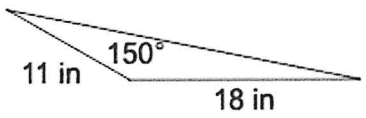
197.5

2.



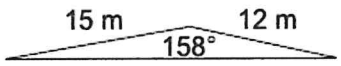
80.0

3.



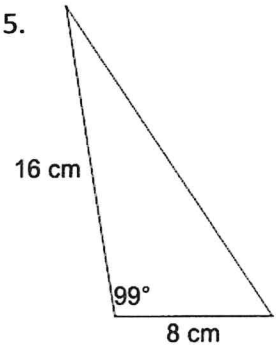
49.5

4.



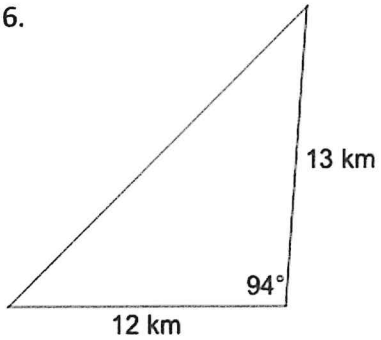
33.7

5.



63.2

6.

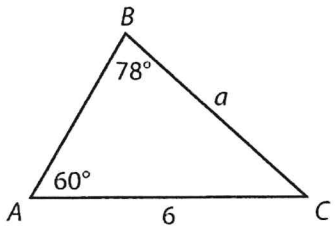


77.8

Section 14.1 – Law of Sines

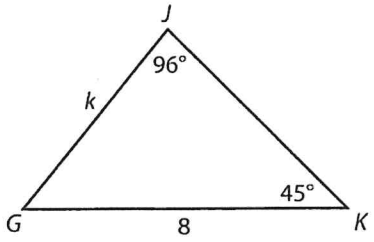
Use the Law of Sines to find all the unknown measures (angle and side lengths).

1.



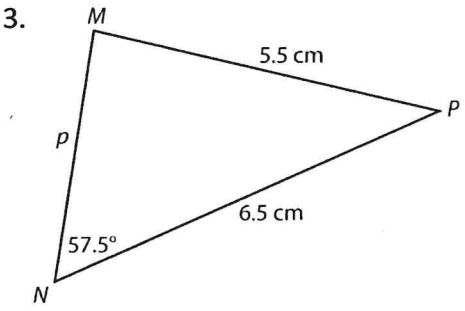
a = 5.3 ∠C = 42° c = 4.1

2.



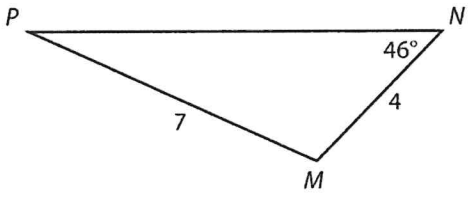
k = 5.7 ∠G = 39° g = 5.1

3.



∠M = 85.4° ∠P = 37.1° p = 3.9

4.

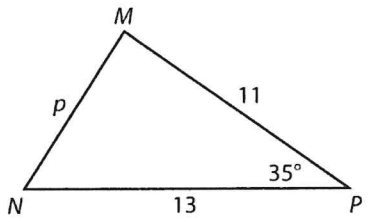


∠P = 24° ∠M = 110° m = 9.1

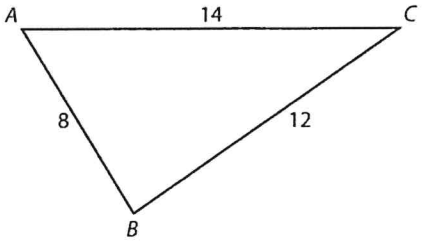
Section 14.2 – Law of Cosines

Use the Law of Cosines to find all the unknown measures (angle and side lengths).

1.



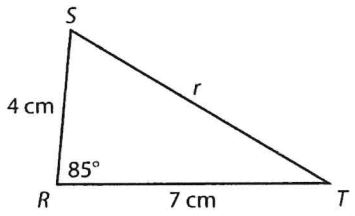
2.



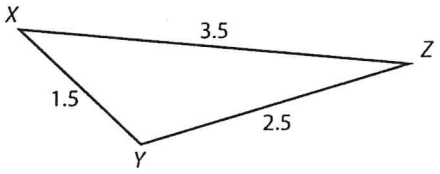
p = 7.5 ∠M = 87.3° ∠N = 57.7°

∠A = 58.8° ∠B = 86.4° ∠C = 34.8°

3.



4.



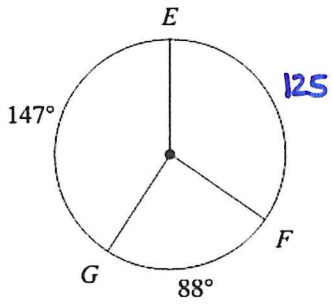
r = 7.75 ∠S = 64.1° ∠T = 30.9°

∠X = 38.2° ∠Y = 120° ∠Z = 21.8°

Section 15.1 – Central Angles and Inscribed Angles

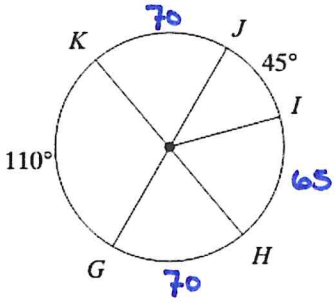
Find the measure of the arc or central angle indicated.

1. $m\widehat{EFG}$



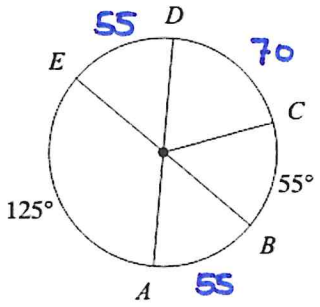
213°

2. $m\widehat{IH}$



65°

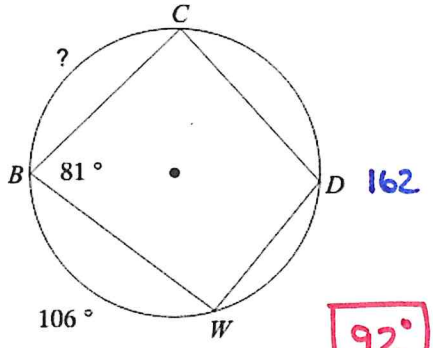
3. $m\widehat{DBE}$



305°

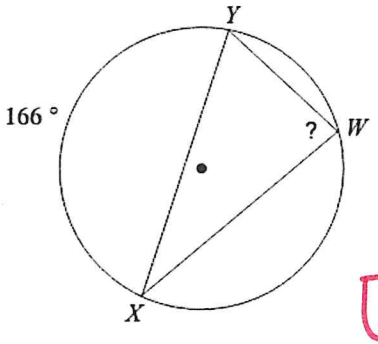
Find the measure of the arc or inscribed angle that is indicated.

4.



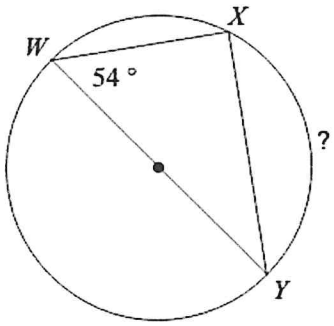
92°

5.



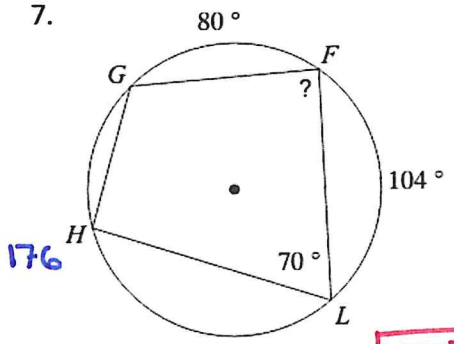
83°

6.



108°

7.

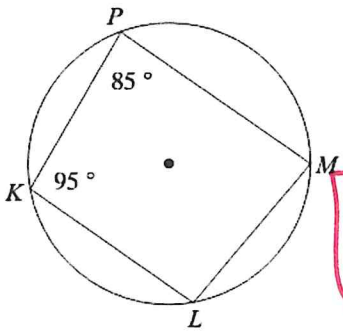


88°

Section 15.2 – Angles in Inscribed Quadrilaterals

Use the Inscribed Quadrilateral Theorem to find the angle measures of the quadrilaterals.

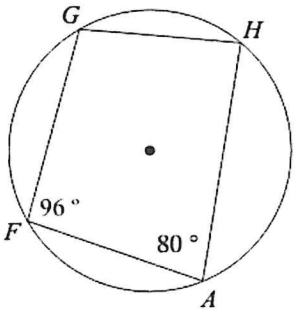
1.



$m\angle L = 95°$

$m\angle M = 85°$

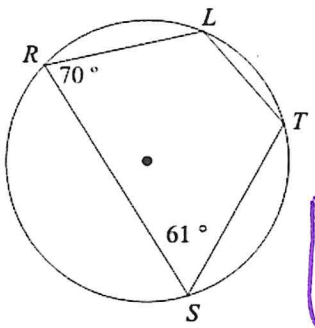
2.



$\angle G = 100°$

$\angle H = 84°$

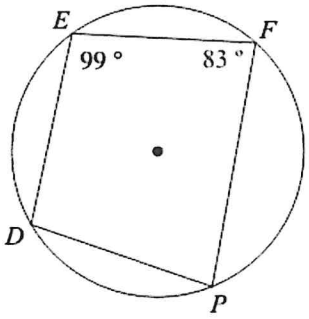
3.



$\angle T = 110°$

$\angle L = 119°$

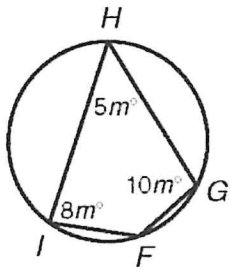
4.



$\angle D = 97°$

$\angle P = 81°$

5.



$m = 10$

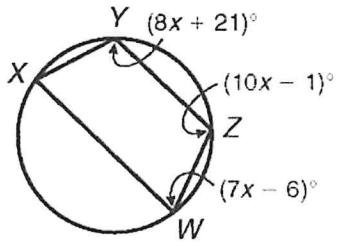
$\angle H = 50$

$\angle G = 100$

$\angle I = 80$

$\angle F = 130$

6.



$x = 11$

$\angle Y = 109°$

$\angle Z = 109°$

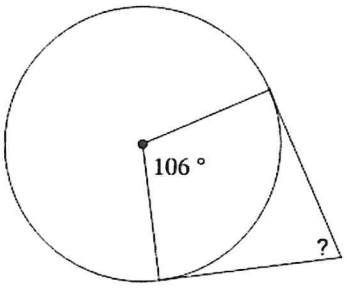
$\angle W = 71°$

$\angle X = 71°$

Section 15.3 – Tangents & Circumscribed Angles

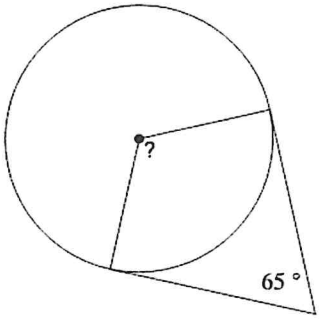
Find the indicated angle measure. Assume that the lines that appear to be tangent are.

1.



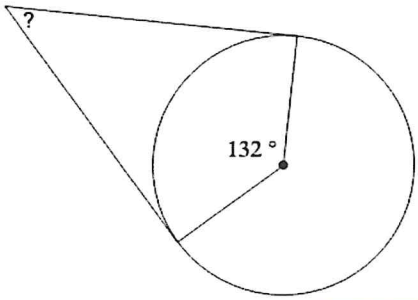
74°

2.



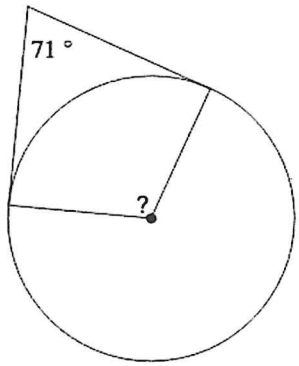
115°

3.



48°

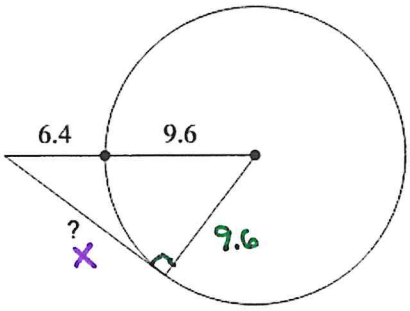
4.



109°

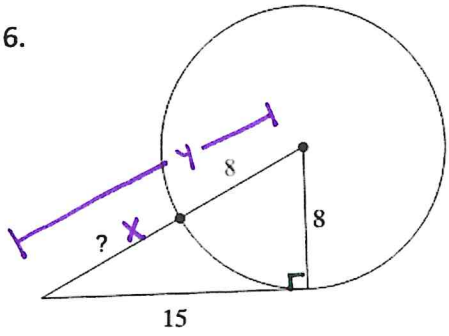
Find the measure of the indicated side length. (Hint: Pythagorean Theorem)

5.



$X = 12.8$

6.

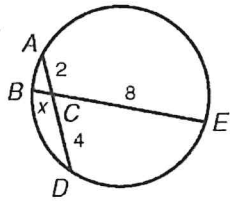


$17 = y$

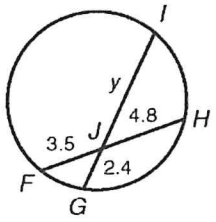
$X = 9$

Section 15.4 – Segment Relationships in Circles

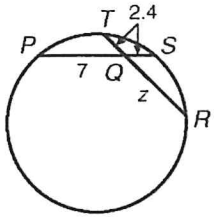
For each figure, determine the value of the variable and the indicated lengths by applying the Chord-Chord Product Theorem.

1. 

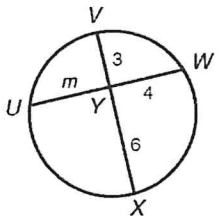
$x =$ 1

2. 

$y =$ 7

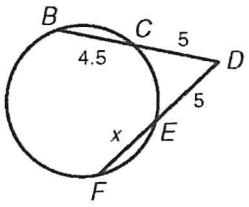
3. 

$z =$ 7

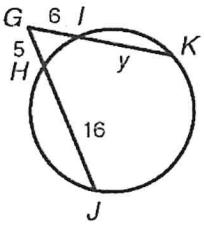
4. 

$m =$ 4.5

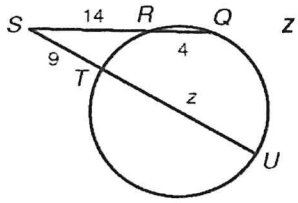
For each figure, determine the value of the variable and the indicated lengths by applying the Secant-Secant Product Theorem.

5. 

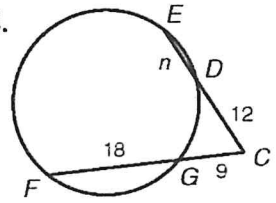
$x =$ 4.5

6. 

$y =$ 11.5

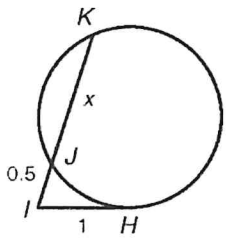
7. 

$z =$ 19

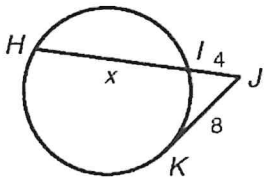
8. 

$n =$ 8.25

For each figure, determine the value of the variable and the indicated length by applying the Secant-Tangent Product Theorem.

9. 

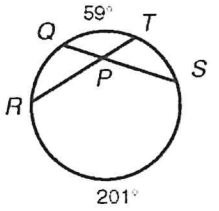
$x =$ 1.5

10. 

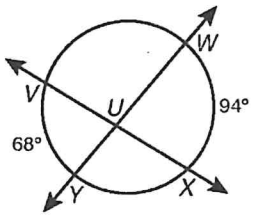
$x =$ 12

Section 15.5 – Segment Relationships in Circles

For each figure, determine the measure of the angle by applying the Intersecting Chords Angle Measure Theorem.

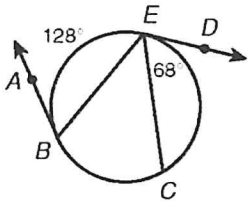
1. 

$m\angle RPS =$ 130°

2. 

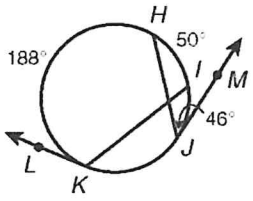
$m\angle YUV =$ 81°

For each figure, determine the measures of the indicated angle and arc by applying the Tangent-Secant Interior Angle Measure Theorem.

3. 

$m\angle ABE =$ 64°

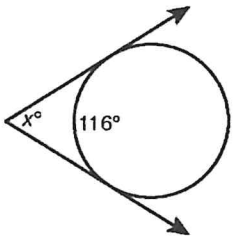
$m\overset{\frown}{CE} =$ 136°

4. 

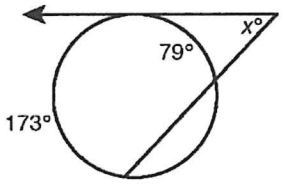
$m\angle LKI =$ 119°

$m\overset{\frown}{IJ} =$ 42°

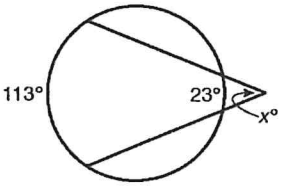
For each figure, determine the value of *x* by applying the Tangent-Secant Exterior Angle Measure Theorem.

5. 

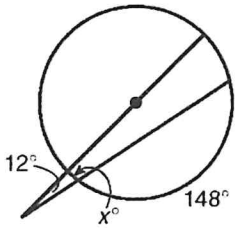
$x =$ 64°

6. 

$x =$ 47°

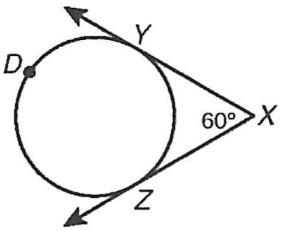
7. 

$x =$ 45°

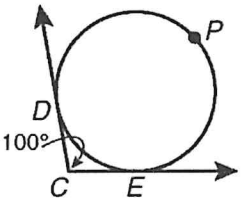
8. 

$x =$ 8°

For each figure, determine the measure of the intercepted minor arc.

9. 

$m\overset{\frown}{YZ} =$ 120°

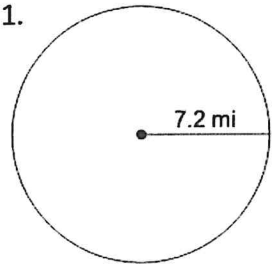
10. 

$m\overset{\frown}{DE} =$ 80°

Section 16.1 – Circumference and Area of a Circle

Find the circumference and area of each circle. Use 3.14 for π. Round to the nearest tenth.

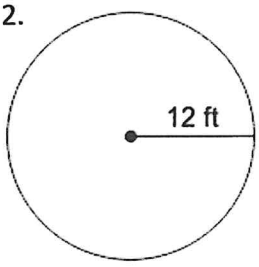
1.



C = 45.2

A = 162.6

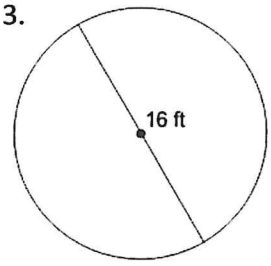
2.



C = 75.4

A = 452.2

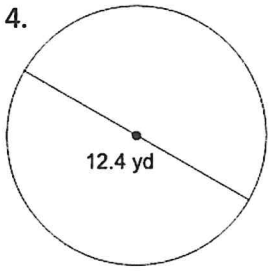
3.



C = 50.2

A = 201.0

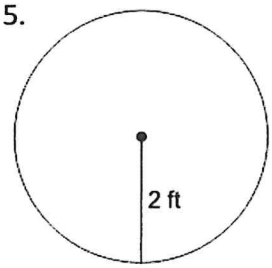
4.



C = 38.9

A = 120.6

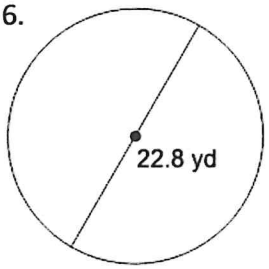
5.



C = 12.6

A = 12.6

6.



C = 71.6

A = 408.2

Given the circumference find the area of the circle. Use 3.14 for π.

7. $C = 37.7$

→ A = 113.04

r = 6

8. $C = 18.8$

→ A = 28.3

r = 3

9. $C = 44$

→ A = 153.9

r = 7

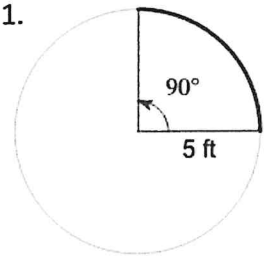
10. $C = 69.1$

→ A = 379.9

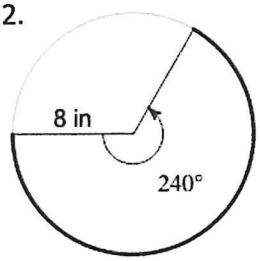
r = 11

Section 16.2 – Arc Length & Radian Measure

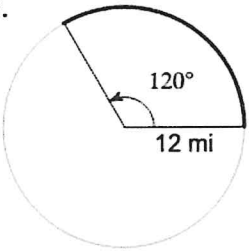
Find the indicated arc length of each circle. Use 3.14 for π. Round to the nearest tenth.

1. 

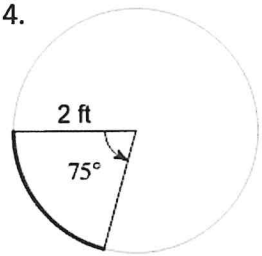
7.85

2. 

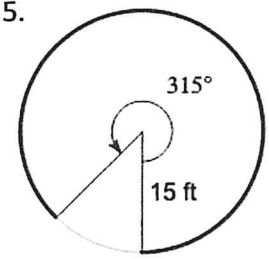
33.5

3. 

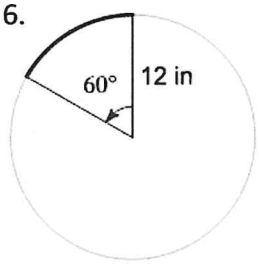
25.1

4. 

2.6

5. 

82.4

6. 

12.6

Convert each angle measure to radian measure.

7. 150° $\frac{5\pi}{6}$

8. 30° $\frac{\pi}{6}$

9. 225° $\frac{5\pi}{4}$

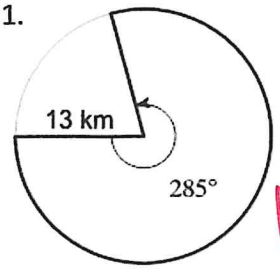
10. 270° $\frac{3\pi}{2}$

Section 16.3 – Sector Area

Find the area of each sector of the circle. As a multiple of π and round to the nearest tenth.

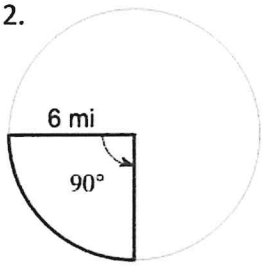
Use 3.14 for π.

1.



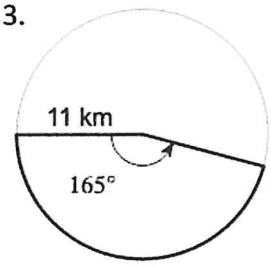
420.1

2.



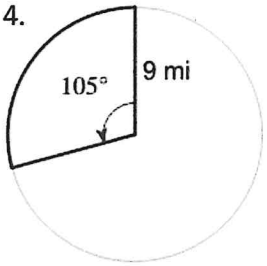
28.3

3.



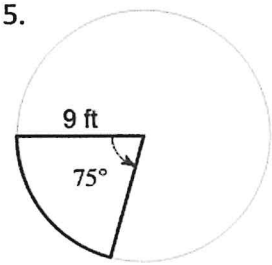
174.1

4.



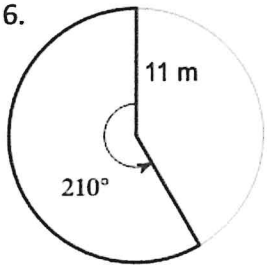
74.2

5.



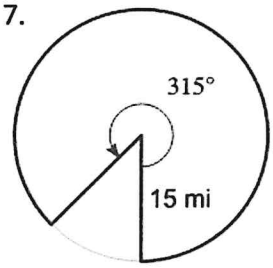
53.0

6.



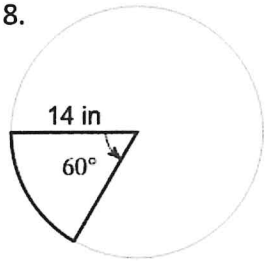
221.6

7.



618.2

8.



102.6

Section 17.1 – Equation of a Circle

Write an equation of the circle with the given center and radius.

1. *Center*: $(6, -5)$; *radius*: 8

$(x-6)^2 + (y+5)^2 = 64$

2. *Center*: $(-7, 16)$; *radius*: 1

$(x+7)^2 + (y-16)^2 = 1$

3. *Center*: $(2, 10)$; *radius*: 4

$(x-2)^2 + (y-10)^2 = 16$

4. *Center*: $(-12, -5)$; *radius*: 7

$(x+12)^2 + (y+5)^2 = 49$

5. *Center*: $(2, -13)$; *radius*: 5

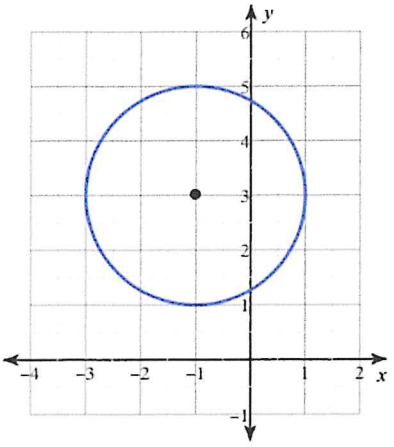
$(x-2)^2 + (y+13) = 25$

6. *Center*: $(-9, 15)$; *radius*: 3

$(x+9)^2 + (y-15)^2 = 9$

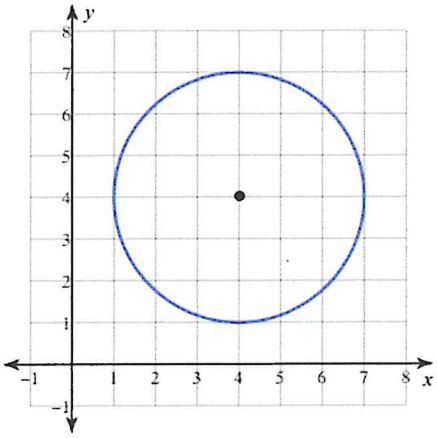
Given the graph, write an equation of the circle with the given center and radius.

7.



$(x+1)^2 + (y-3)^2 = 4$

8.

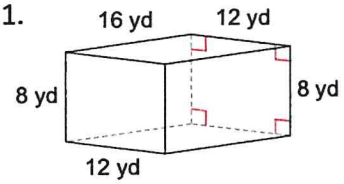


$(x-4)^2 + (y-4)^2 = 9$

Section 18.1 – Volume of Prisms & Cylinders

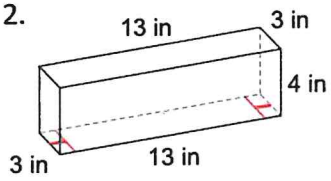
Find the volume of the following prisms & cylinders. Round to the nearest hundredth.

1.



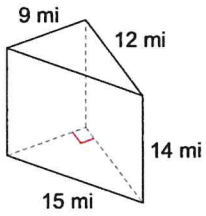
1536 yd^3

2.



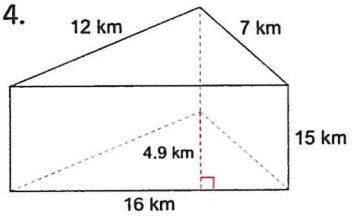
156 in^3

3.



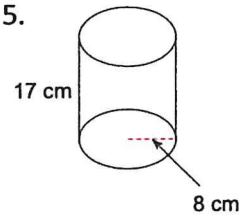
756 mi^3

4.



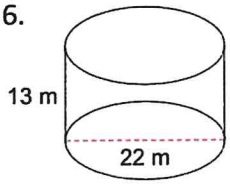
588 km^3

5.



3418.05 cm^3

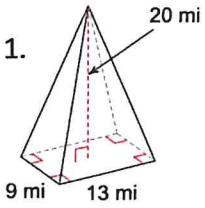
6.



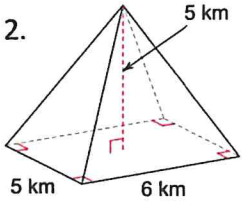
4941.73 m^3

Section 18.2 – Volume of Pyramids

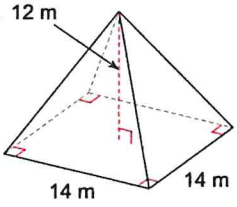
Find the volume of the following pyramids. Round to the nearest hundredth.

1. 

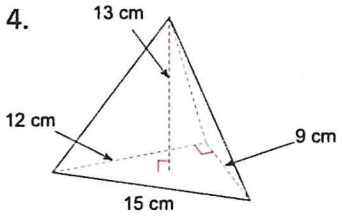
780 mi^3

2. 

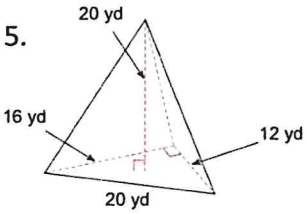
50 km^3

3. 

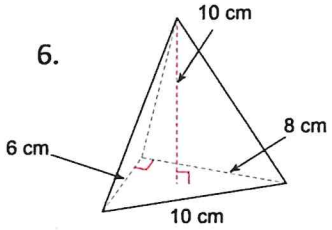
784 m^3

4. 

234 cm^3

5. 

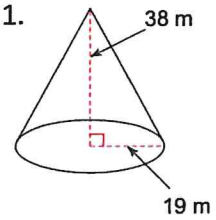
640 yd^3

6. 

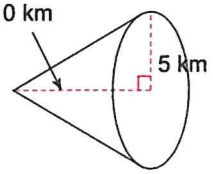
80 cm^3

Section 18.3 – Volume of Cones

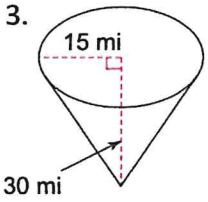
Find the volume of the following cones. Round to the nearest hundredth.

1. 

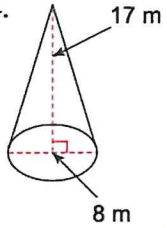
14365.46 m^3

2. 10 km 

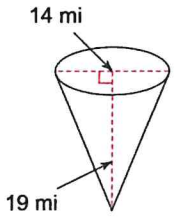
261.80 km^3

3. 

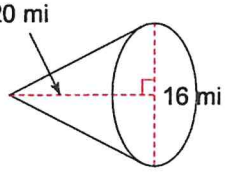
7068.58 mi^3

4. 

284.84 m^3

5. 

974.94 mi^3

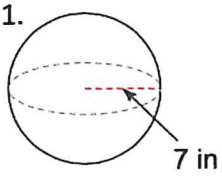
6. 20 mi 

1340.41 mi^3

Section 18.4 – Volume of Spheres

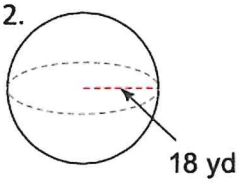
Find the volume of the following spheres. Round to the nearest hundredth.

1.



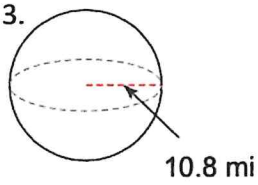
1436.76 in^3

2.



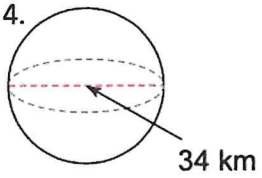
24429.02 yd^3

3.



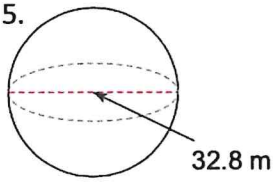
5276.67 mi^3

4.



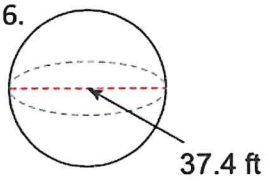
20579.53 km^3

5.



18476.52 m^3

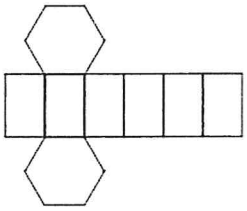
6.



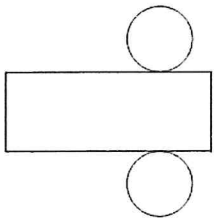
27391.35 ft^3

Section 19.1 – Cross Sections & Solids of Rotation

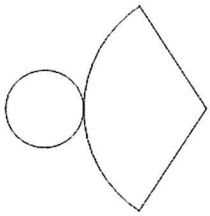
Identify what 3D shape is formed by the following nets.

1. 

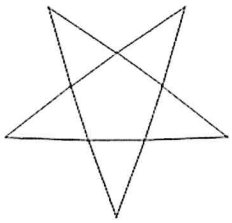
HEXAGONAL PRISM

2. 

CYLINDER

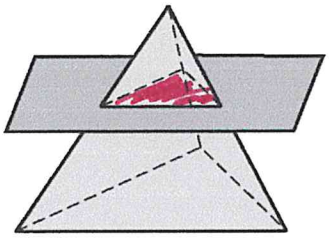
3. 

CONE

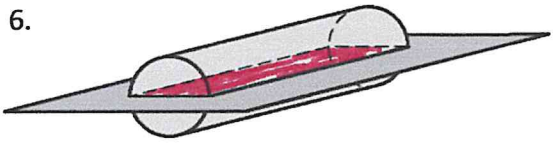
4. 

PENTAGONAL PYRAMID

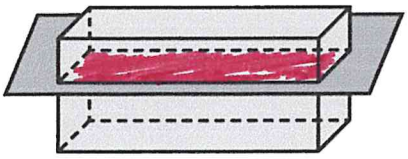
Describe each cross section of each figure.

5. 

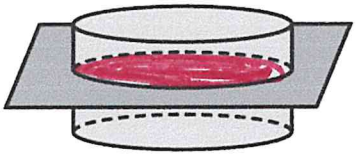
TRIANGLE

6. 

RECTANGLE

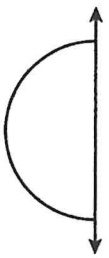
7. 

RECTANGLE

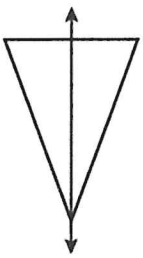
8. 

CIRCLE

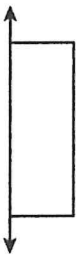
Describe the 3D figure that is formed by rotating the following shapes around the line.

9. 

SPHERE

10. 

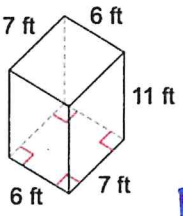
CONE

11. 

CYLINDER

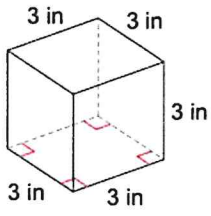
Section 19.2 – Surface Area of Prisms & Cylinders

Find the lateral & surface area of the following prisms and cylinders.

1. 

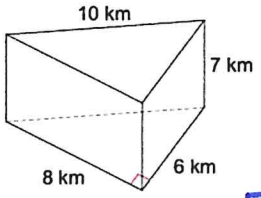
LA = 286

SA = 370

2. 

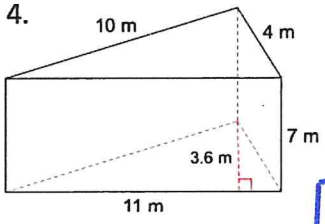
LA = 36

SA = 54

3. 

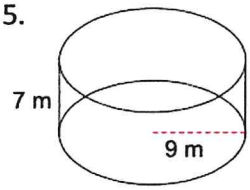
LA = 168

SA = 216

4. 

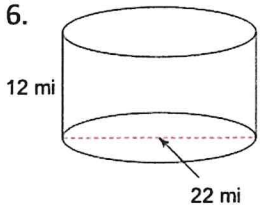
LA = 175

SA = 214.6

5. 

LA = 126π or 395.84

SA = 288π or 904.78

6. 

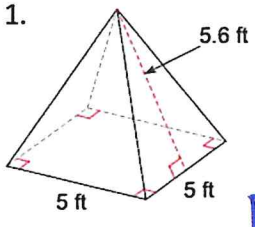
LA = 264π or 829.38

SA = 506π or 1589.65

Section 19.3 – Surface Area of Pyramids & Cones

Find the lateral & surface area of the following pyramids and cones.

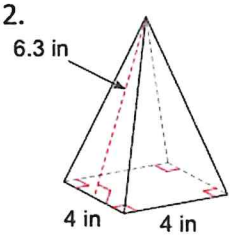
1.



LA = 56

SA = 81

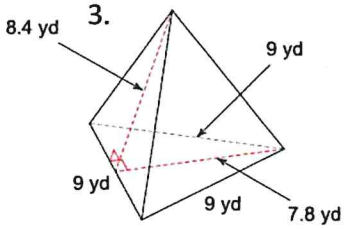
2.



LA = 50.4

SA = 66.4

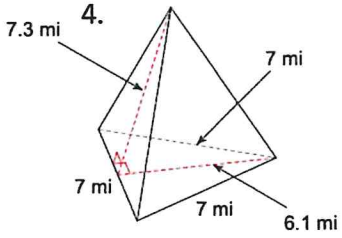
3.



LA = 113.4

SA = 148.5

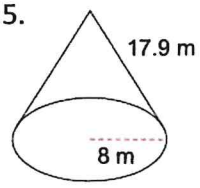
4.



LA = 76.65

SA = 98

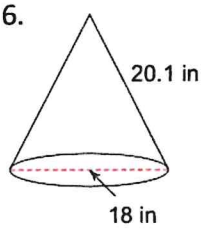
5.



LA = 143.2π = 449.88

SA = 207.2π = 650.94

6.



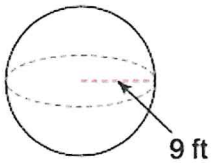
LA = 180.9π = 568.3

SA = 261.9π = 822.78

Section 19.4 – Surface Area of Spheres

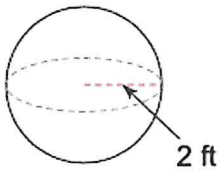
Find the surface area of the following spheres.

1.



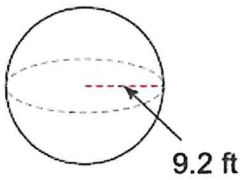
1017.88

2.



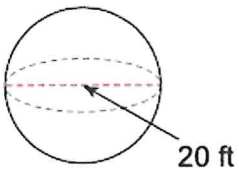
50.27

3.



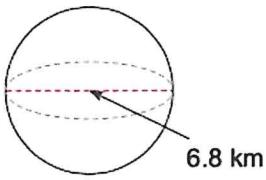
1063.62

4.



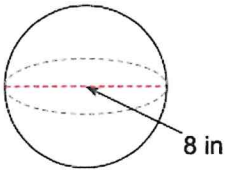
1256.64

5.



145.27

6.



201.06