Name _____ Date _____ Class _____

Geometry B: Final Exam Review

Modules 11 - 19

Section 11.1 – Dilations

Apply the dilation.

1. D: (x , y) → (2x , −2y)   G (1 , −2),   H (1 , −4),   K (4 , −2).

     G′ (_____ , _____), H′ (_____ , _____), K′ (_____ , _____)

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

     L′ (_____ , _____), M′ (_____ , _____), N′ (_____ , _____)

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

3.

4.

5.

6.
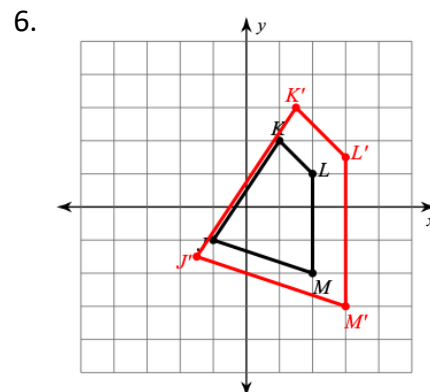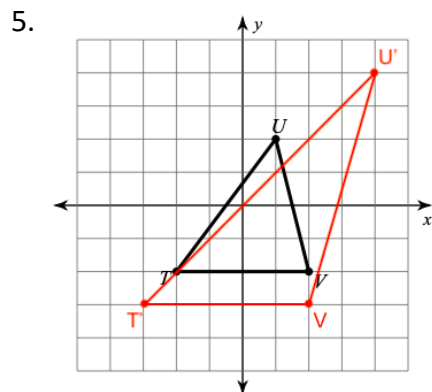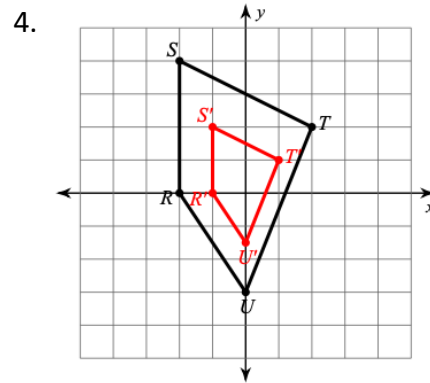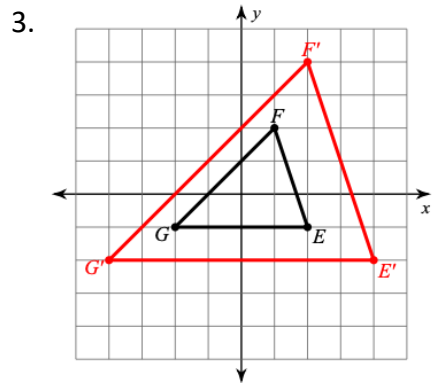
Section 11.2 – Proving Figures are Similar with Transformations

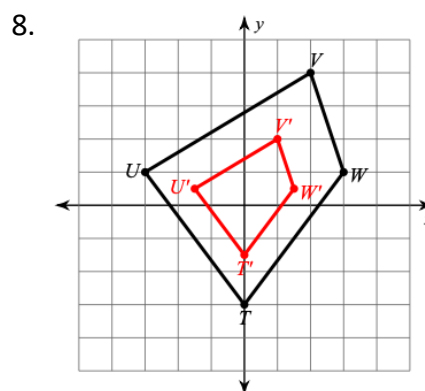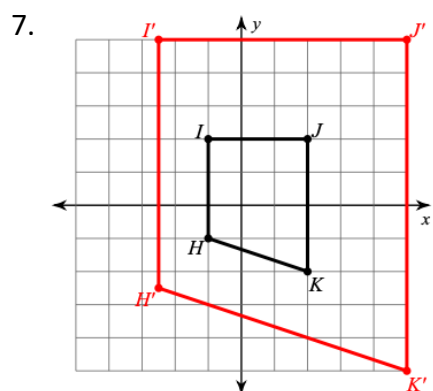1. Which of the following isn't preserved after a dilation?
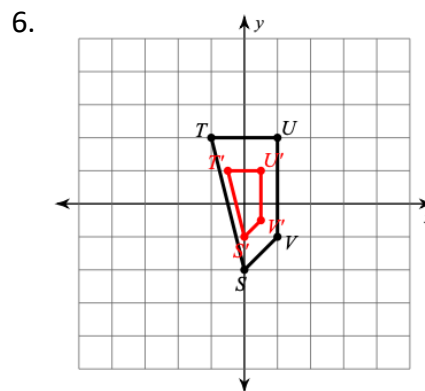
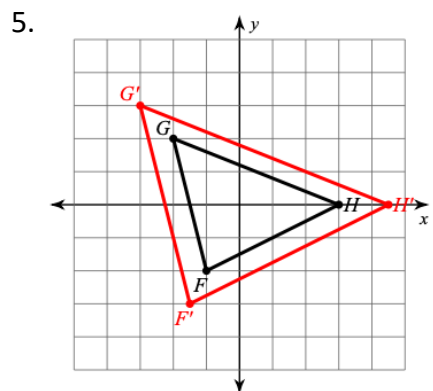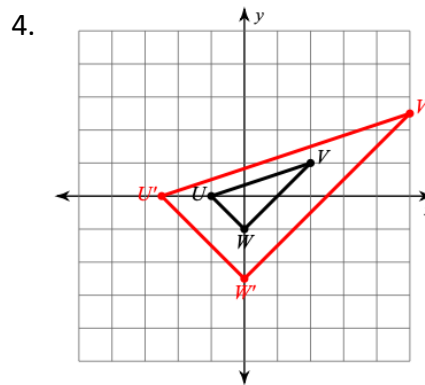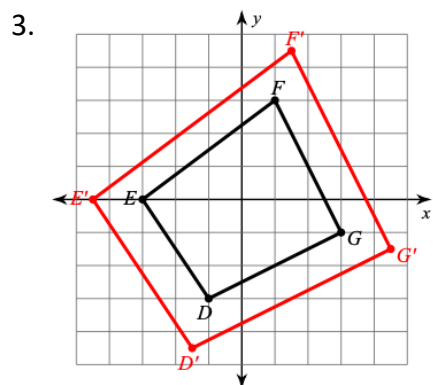   BETWEENESS   ANGLE MEASURES   SIDE LENGTHS   ORIENTATION

2. Are all circles similar?   YES   or   NO
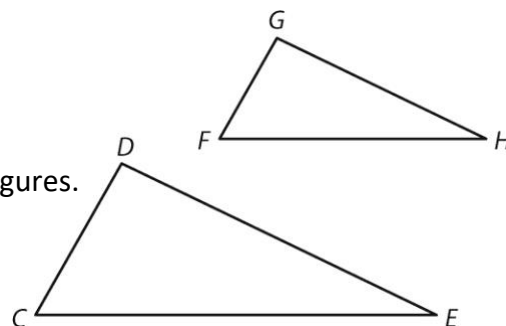
Given the figures are similar, determine what the scale factor of the dilation is.

3.

4.

5.

6.

7.

8.

Section 11.3 – Corresponding Parts of Similar Figures

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

ΔCDE ~ ΔFGH

$m\angle C = m\angle$ _____ $m\angle D = m\angle$ _____ $m\angle E = m\angle$ _____

$$\frac{\rule{1cm}{0.4pt}}{FG} = \frac{DE}{\rule{1cm}{0.4pt}} \qquad \frac{\rule{1cm}{0.4pt}}{FH} = \frac{\rule{1cm}{0.4pt}}{HG} \qquad \frac{CD}{CE} = \frac{\rule{1cm}{0.4pt}}{\rule{1cm}{0.4pt}}$$

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

ΔNLM ~ ΔRPQ
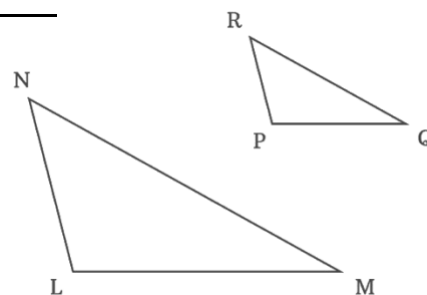
$$\frac{NM}{\rule{1cm}{0.4pt}} = \frac{NL}{\rule{1cm}{0.4pt}} \qquad \frac{\rule{1cm}{0.4pt}}{QP} = \frac{\rule{1cm}{0.4pt}}{QR} \qquad \frac{LM}{\rule{1cm}{0.4pt}} = \frac{\rule{1cm}{0.4pt}}{PR}$$

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

3.

25
40   ?
48

4.

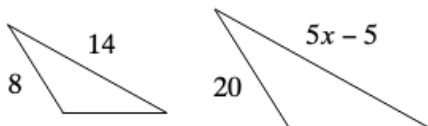?   18   25   15

5.
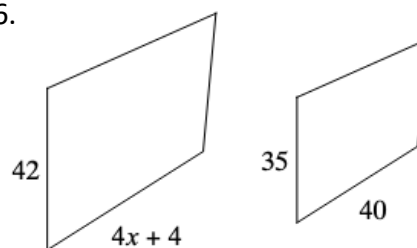
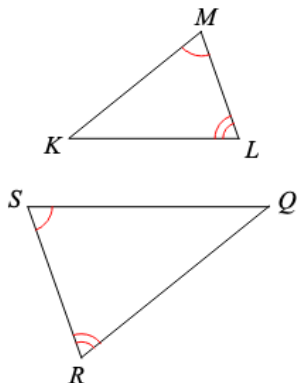14   5x − 5
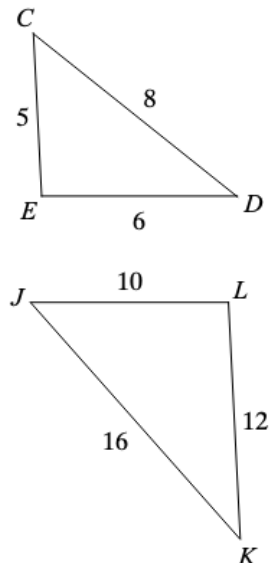8   20

6.

42   35
40
4x + 4
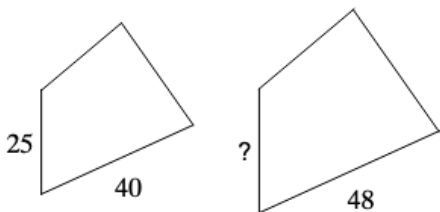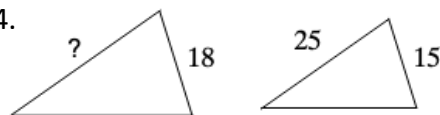
Section 11.4 – AA Similarity of Triangles

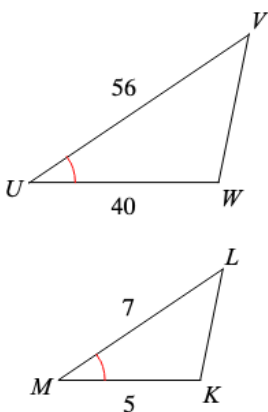**Determine if the triangles are similar using AA~, SSS~, or SAS~**
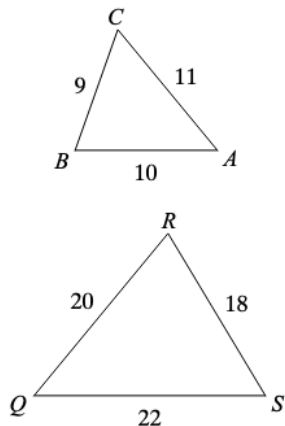
1. $\triangle SRQ \sim \triangle MLK$
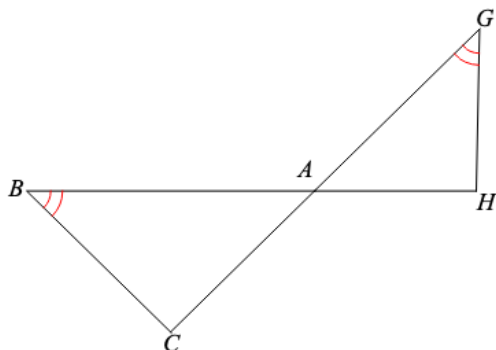
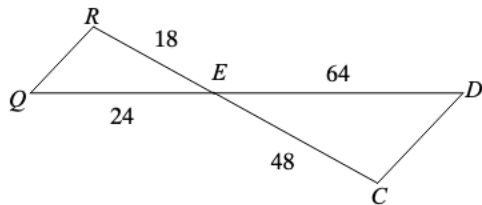2. $\triangle JKL \sim \triangle CDE$

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

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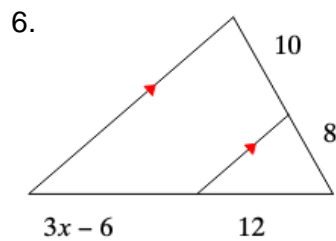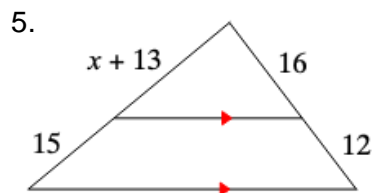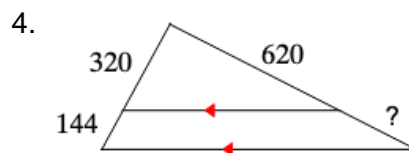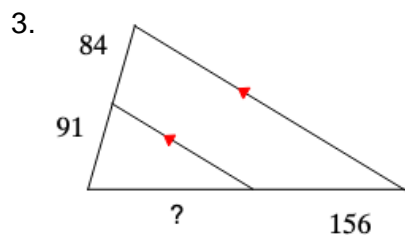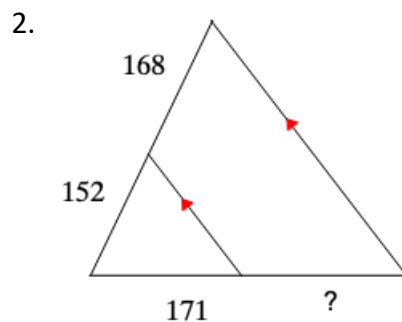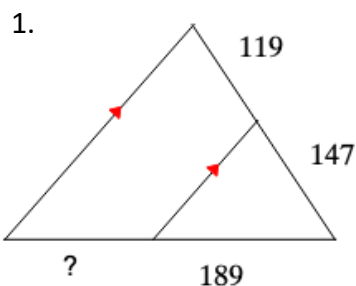
5. $\triangle ABC \sim \triangle AGH$

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

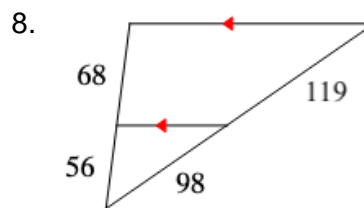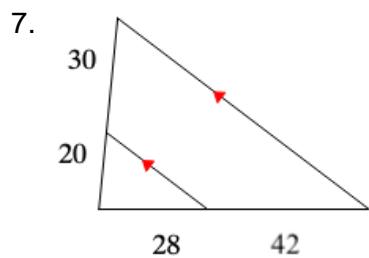## Section 12.1 – Triangle Proportionality Theorem

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

1.

119
147
?
189

2.

168
152
171
?

3.

84
91
?
156

4.

320
620
144
?

5.

x + 13
16
15
12

6.

10
8
3x – 6
12

Verify if the line segments are parallel

7.

30
20
28
42

8.

68
119
56
98

Section 12.2 – Subdividing a Segment in a Given Ratio

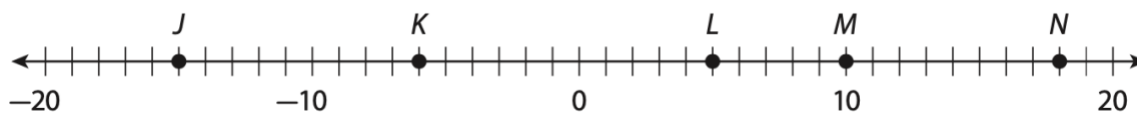**Find the coordinates of the point P that divides the line segment AB in the given ratio.**

1.   A(−9, −1), B(11, 9);   3 to 2

2.   A(−1, 9), B(23, −7);   7 to 1

3.   A(−7, 12), B(9, 0);   1 to 3

4.   A(7,−4), B(−7, 3);   3 to 4

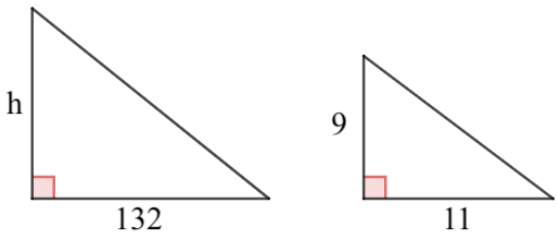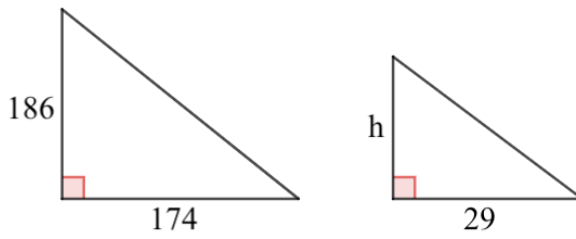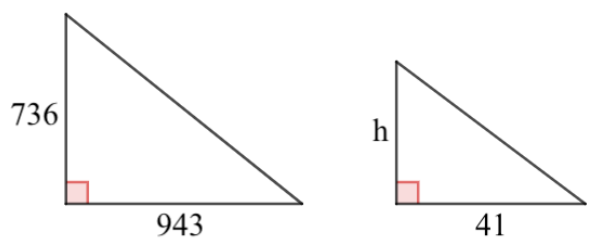**Find the coordinate of the point P that divides each directed line segment in the given ratio.**
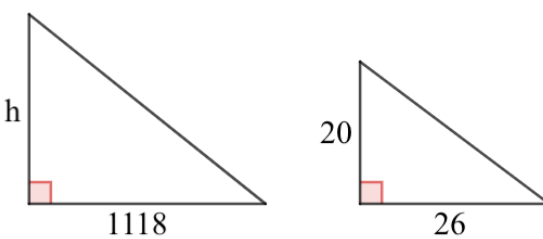

5.   from J to M; 2 to 3
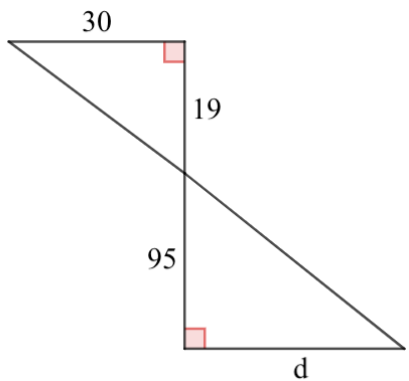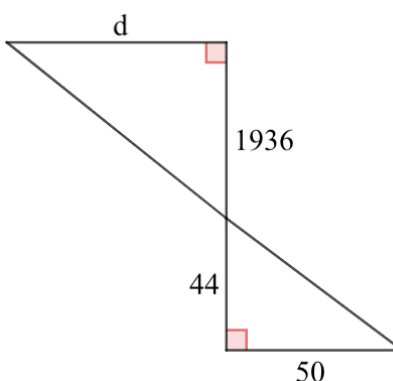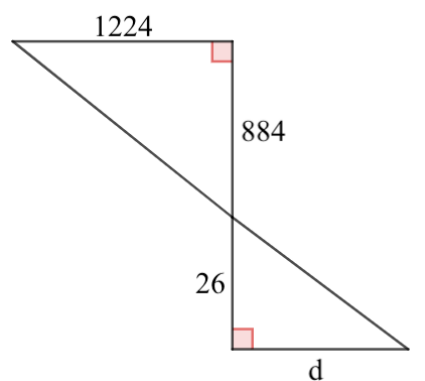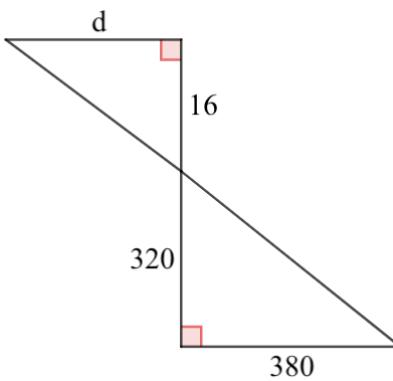
6.   from K to N; 5 to 1

Section 12.3 – Using Proportional Relationships

Using similar triangles. Find the height for the following problems

1.

h

132

9

11

2.

186

174

h

29

3.

736

943

h

41

4.

h

1118

20

26

Using similar triangles. Find the distance for the following problems

5.

30

19

95

d

6.

d

1936

44

50

7.

1224

884
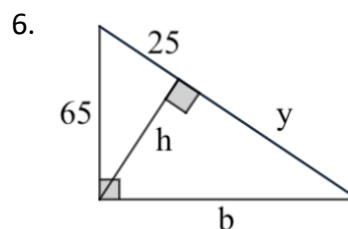
26

d

8.

d

16

320

380

Section 12.4 – Similarity in Right Triangles

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

1.   **5** and **80**   2.   **169** and **64**   3.   **3** and **75**

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

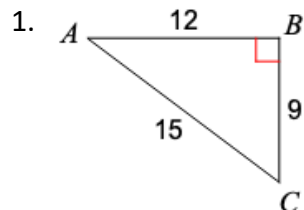3.

4.

5.

6.

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

$$\boxed{\textbf{TOA}}$$

$$tangent = \underline{\hspace{4cm}}$$
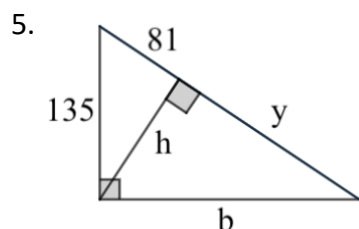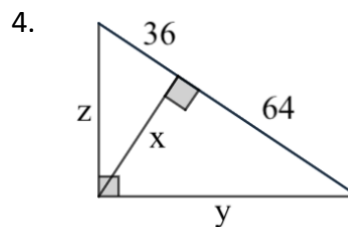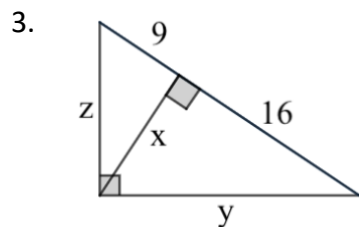
Find the tangent ratio of each specified angle. Write each ratio as a fraction and decimal rounded to the nearest hundredth.
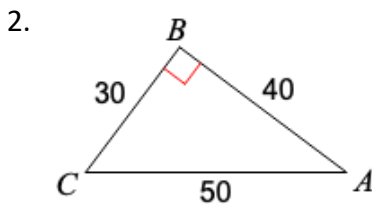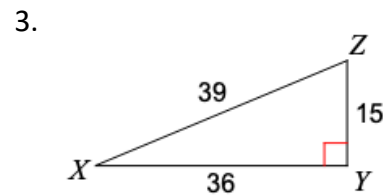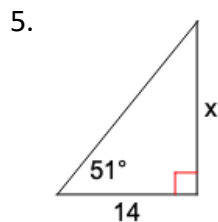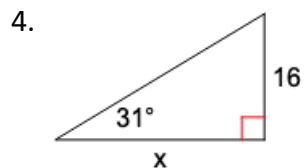
1.

A ———12——— B (right angle at B)
15 (on AC)
9 (on BC)
C

∠A

2.

B (right angle at B)
30 (BC), 40 (BA)
C ———50——— A

∠C

3.

Z (top right)
39 (XZ), 15 (ZY)
X ———36——— Y (right angle at Y)

∠X

∠C

∠A

∠Z

Apply the tangent ratio to find unknown lengths

4.

31° angle, 16 (vertical side), x (bottom side, right angle at bottom right)

5.

51° angle, 14 (bottom), x (vertical side, right angle)

Apply the tangent ratio to find unknown lengths

$$\boxed{\textbf{TOA}}$$

6.

? angle, 101 (bottom), 31 (right side, right angle)

7.

32 (top), 22 (left side), ? angle (right angle at top left)

SOH CAH

$$sine = \underline{\hspace{4cm}}$$
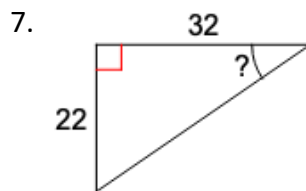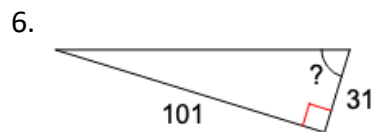
Find the sine & cosine ratio of each specified angle. Write each ratio as a fraction and round to 2 decimal places.

$$cosine = \underline{\hspace{4cm}}$$

1.

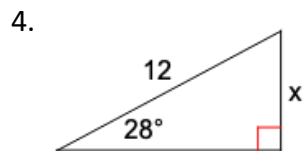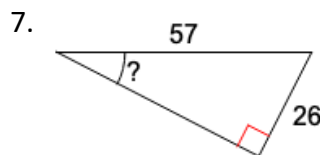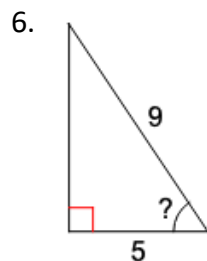
$\sin A$

$\cos A$

2.

$\sin C$

$\cos C$

3.
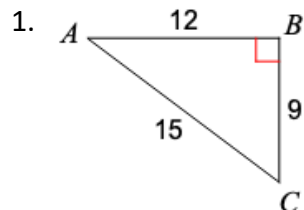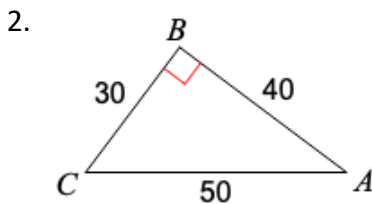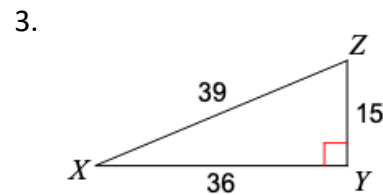
$\sin X$

$\cos X$

Apply the sine and cosine ratio to find unknown lengths

4.

5.

Apply the sine and cosine ratio to find unknown lengths
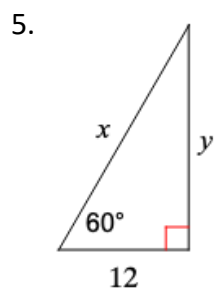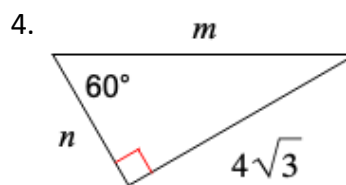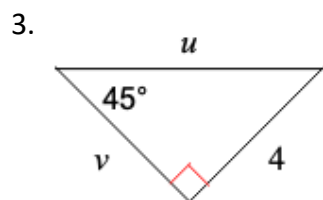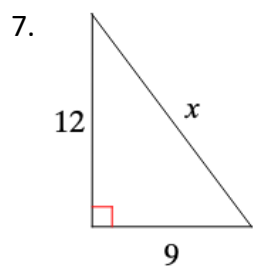
SOH CAH

6.

7.

Section 13.3 – Special Right Triangles

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

1.

$45°$ x
y
6

2.

$13\sqrt{2}$ m
$45°$
n

3.

u
$45°$
v 4

4.

m
$60°$
n
$4\sqrt{3}$

5.

x y
$60°$
12

6.

28 u
$60°$
v
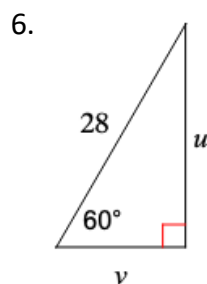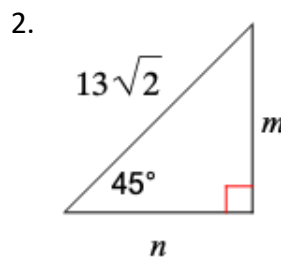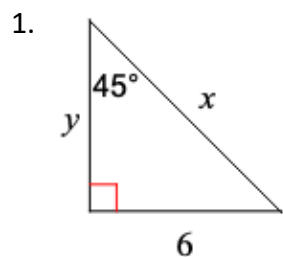
Use the Pythagorean Theorem and Pythagorean Triples to find a missing side length.

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

7.

12 x
9

8.   8, 15, 17

9.   63, 120, 136

10.   99, 132, 165

11.   65, 156, 169

Find the area of each triangle to the nearest tenth.

1.

20 mi

99°

20 mi

2.

8 m

88°

20 m

3.

150°

11 in

18 in

4.

15 m   12 m

158°

5.

16 cm

99°

8 cm

6.

13 km

94°

12 km
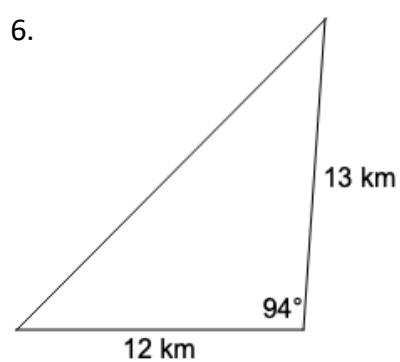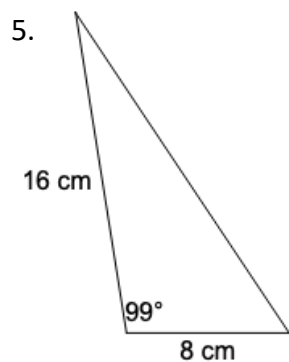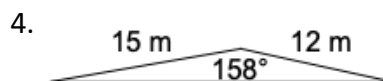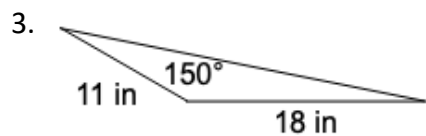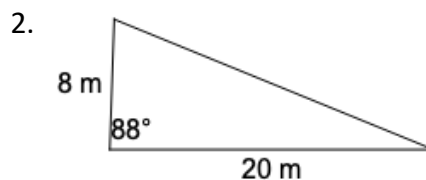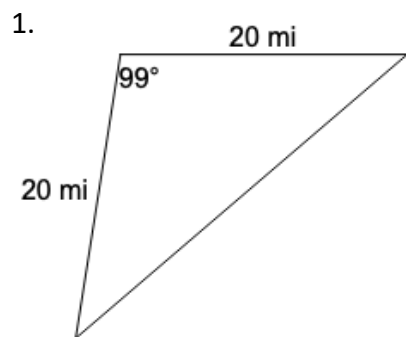
Section 14.1 – Law of Sines

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

1.

2.

a = _____   ∠C = _____   c = _____   k = _____   ∠G = _____   g = _____

3.

4.
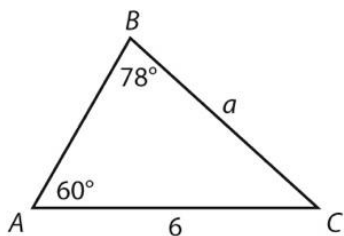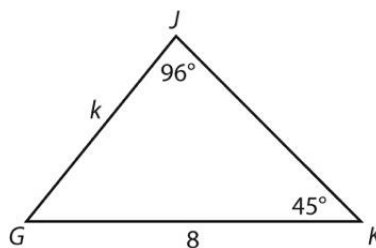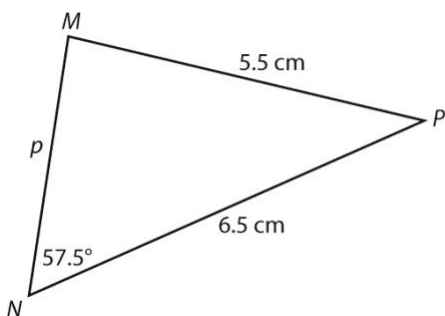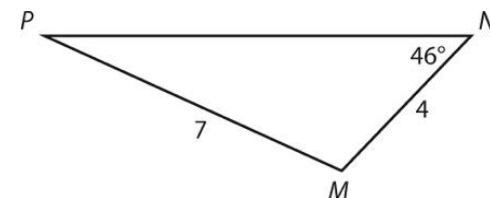
∠M = _____   ∠P = _____   p = _____   ∠P = _____   ∠M = _____   m = _____

Section 14.2 – Law of Cosines

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

1.

2.

p = _____   ∠M = _____   ∠N = _____

∠A = _____   ∠B = _____   ∠C = _____

3.

4.

r = _____   ∠S = _____   ∠T = _____

∠X = _____   ∠Y = _____   ∠Z = _____
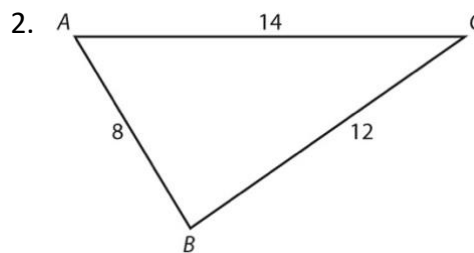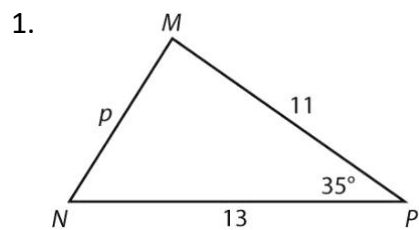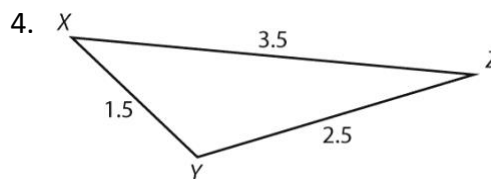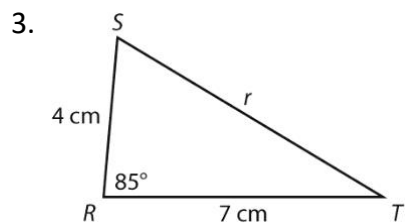
Section 15.1 – Central Angles and Inscribed Angles

Find the measure of the arc or central angle indicated.

1. $m\widehat{EFG}$

147°

E

F

G

88°

2. $m\widehat{IH}$

K

J

45°

I

110°

G

H

3. $m\widehat{DBE}$

D

E

C

55°

125°

A

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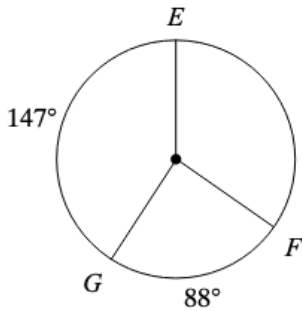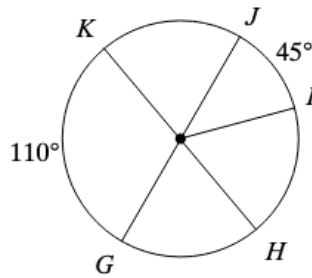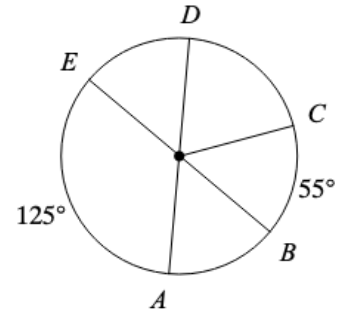
Find the measure of the arc or inscribed angle that is indicated.

4.

C

?

B   81 °

D

106 °

W

5.

Y

166 °

?   W

X

6.

X

W

54 °

?

Y

7.

80 °

F

G

?

104 °

H

70 °

L
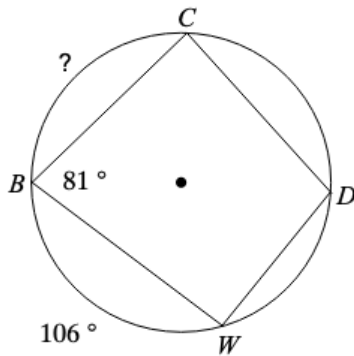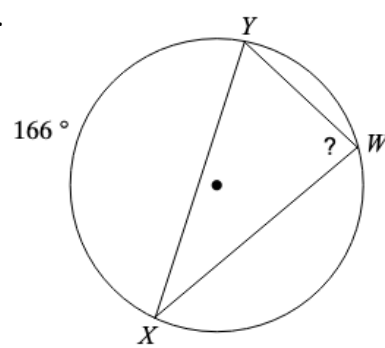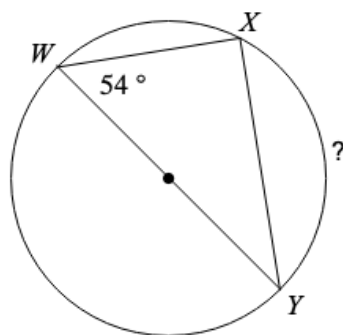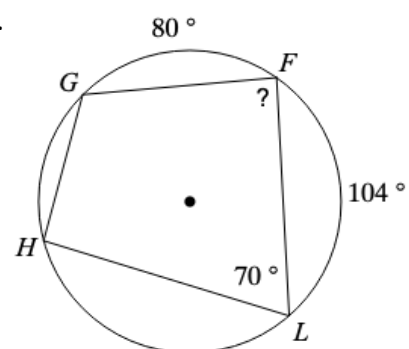
Section 15.2 – Angles in Inscribed Quadrilaterals

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

1.
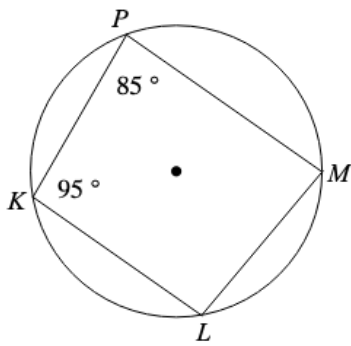
2.
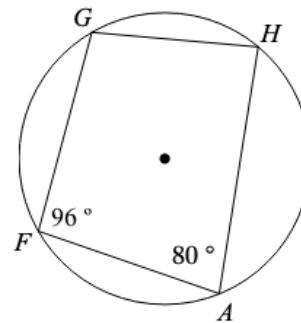
3.
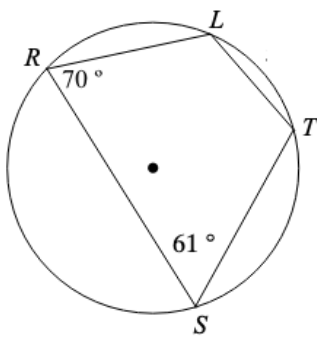
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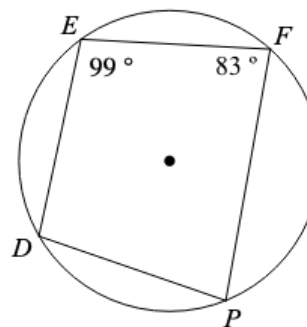
5.
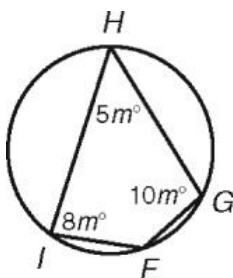
6.
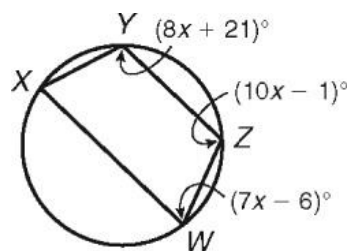
Section 15.3 – Tangents & Circumscribed Angles

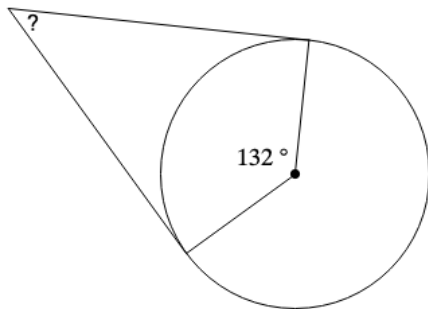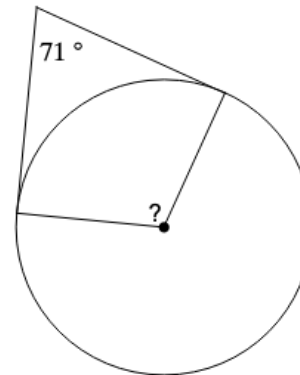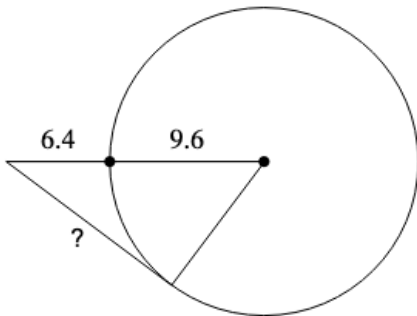**Find the indicated angle measure. Assume that the lines that appear to be tangent are.**
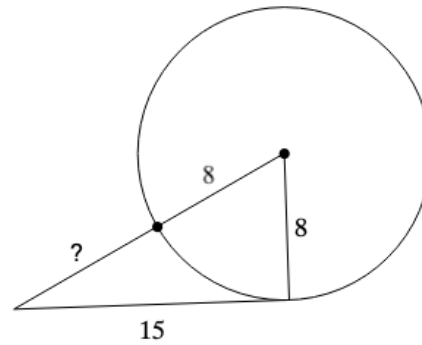
1.

106 °

?

2.

?

65 °

3.

?

132 °

4.

71 °

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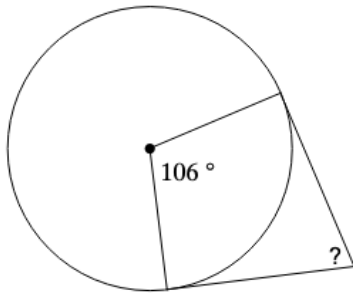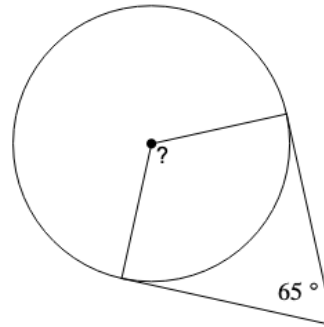
Find the measure of the indicated side length. (Hint: Pythagorean Theorem)

5.

6.4   9.6

?

6.

8

8

?

15

Section 15.4 – Segment Relationships in Circles

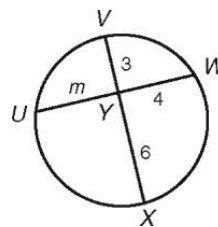**For each figure, determine the value of the variable and the indicated lengths by applying the Chord-Chord Product Theorem.**
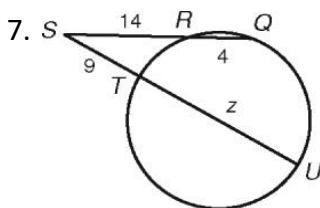
1.

x = _____

2.

y = _____

3.

z = _____

4.
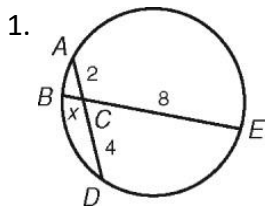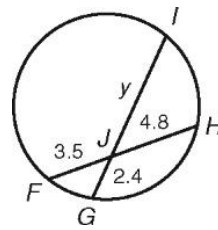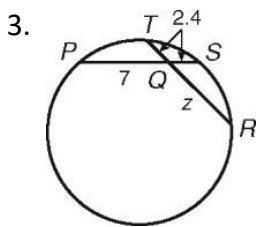
m = _____

For each figure, determine the value of the variable and the indicated lengths by applying the Secant-Secant Product Theorem.
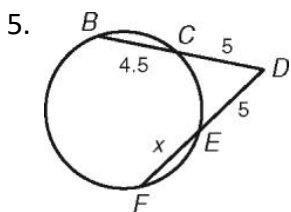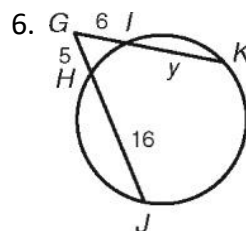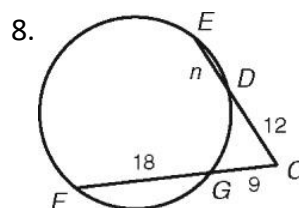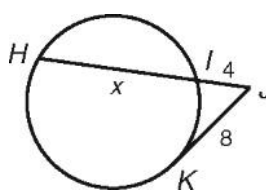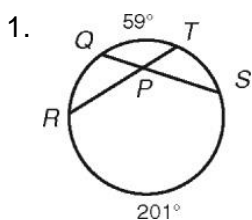
5.

x = _____

6.

y = _____

7.

z = _____

8.

n = _____

For each figure, determine the value of the variable and the indicated length by applying the Secant-Tangent Product Theorem.
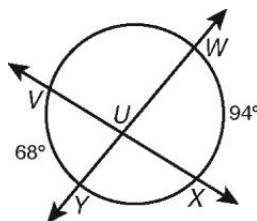
9.

x = _____

10.

x = _____
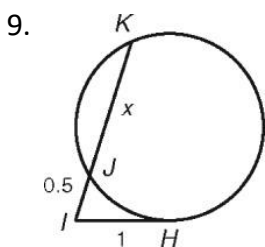
Section 15.5 – Segment Relationships in Circles

For each figure, determine the measure of the angle by applying the Intersecting Chords Angle Measure Theorem.
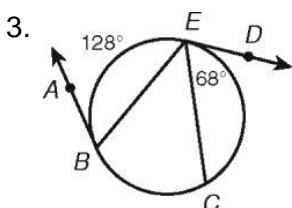
1.

$m\angle RPS =$ _____
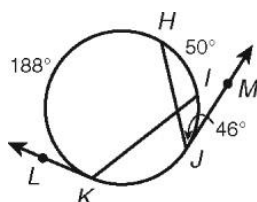
2.

$m\angle YUV =$ _____

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

3.

$m\angle ABE =$ _____

$m\widehat{CE} =$ _____

4.

$m\angle LKI =$ _____

$m\widehat{IJ} =$ _____

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

5.

$x =$ _____

6.

$x =$ _____

7.

$x =$ _____

8.

$x =$ _____
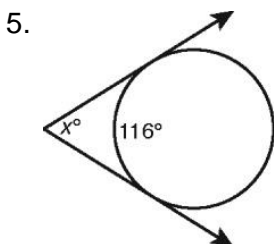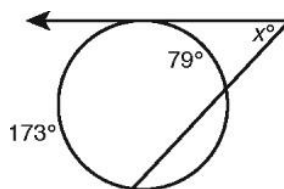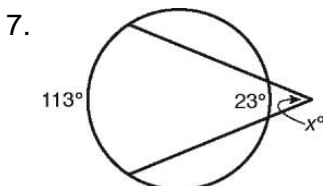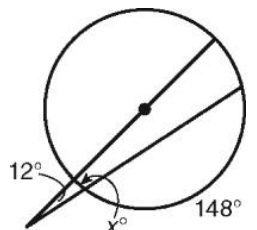
For each figure, determine the measure of the intercepted minor arc.

9.

$m\widehat{YZ} =$ _____

10.

$m\widehat{DE} =$ _____
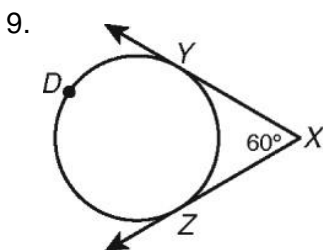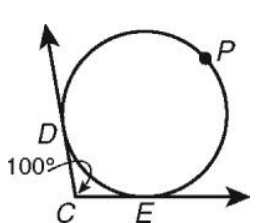
Section 16.1 – Circumference and Area of a Circle

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

1.

7.2 mi

2.

12 ft

3.

16 ft

4.

12.4 yd

5.

2 ft

6.

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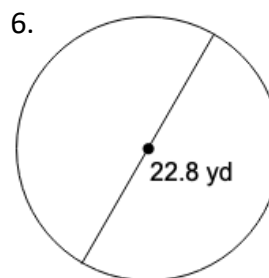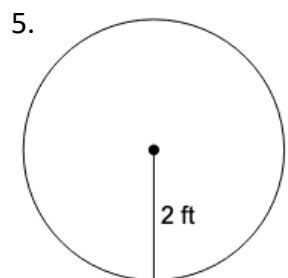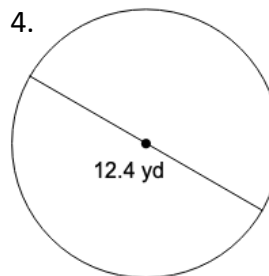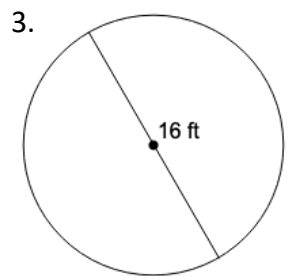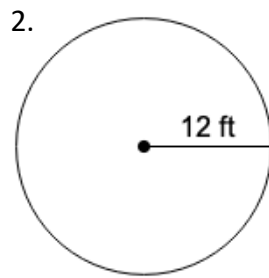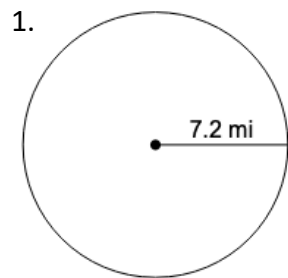
Given the circumference find the area of the circle. Use 3.14 for π.

7. $C = 37.7$

8. $C = 18.8$

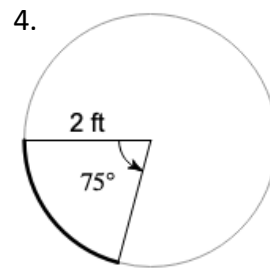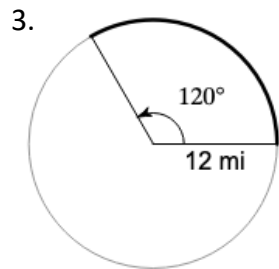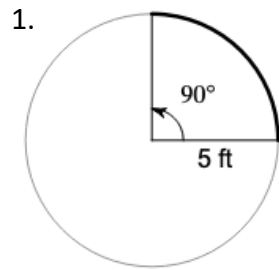9. $C = 44$

10. $C = 69.1$

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.

2.

3.

4.

5.

6.
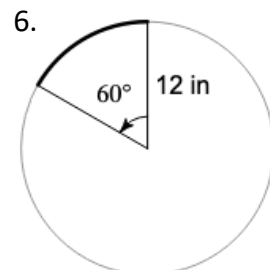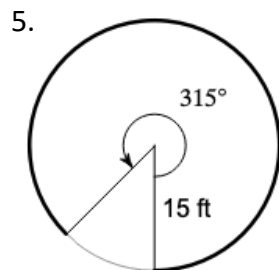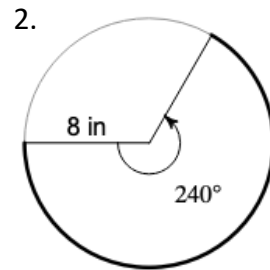
Convert each angle measure to radian measure.

7.   150°

8.   30°
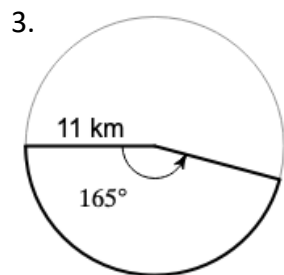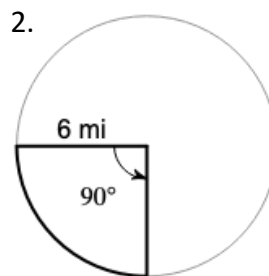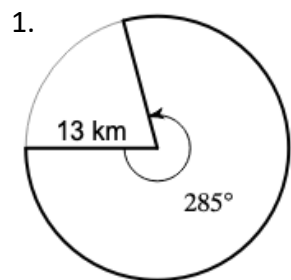
9.   225°

10.   270°

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.

13 km

285°

2.

6 mi

90°

3.

11 km

165°

4.

105°   9 mi

5.

9 ft

75°

6.

11 m

210°

7.

315°

15 mi

8.

14 in

60°
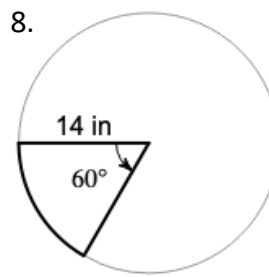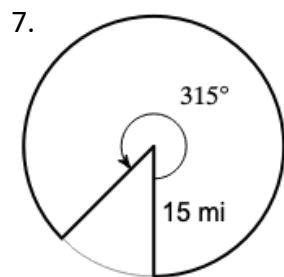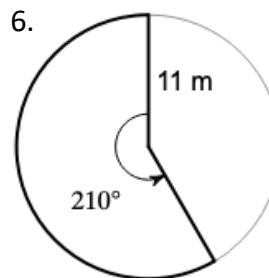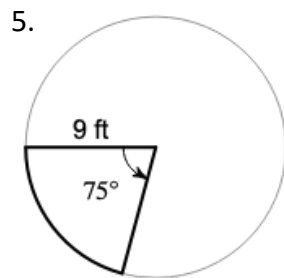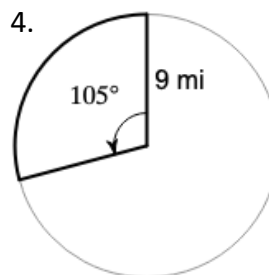
<u>Section 17.1 – Equation of a Circle</u>

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

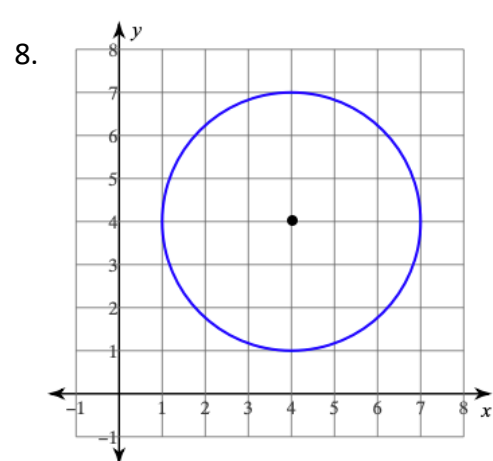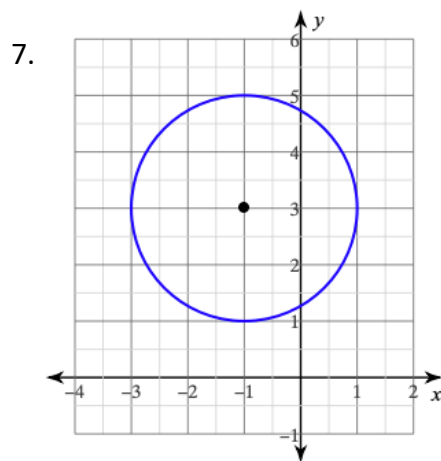1. $Center: (6, -5); \ radius: 8$

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

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

4. $Center: (-12, -5); \ radius: 7$
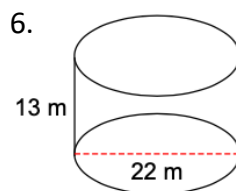
5. $Center: (2, -13); \ radius: 5$

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

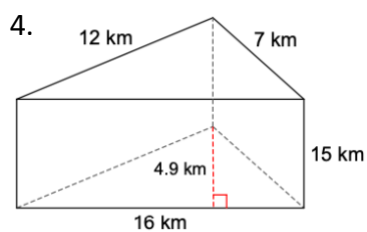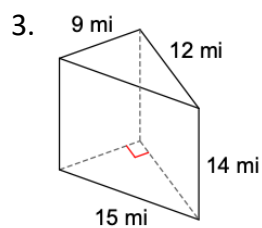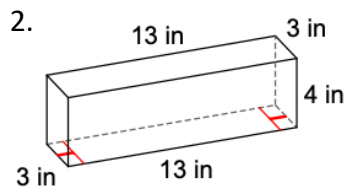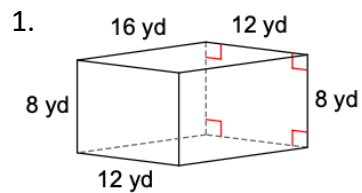**Given the graph, write an equation of the circle with the given center and radius.**

7.

8.

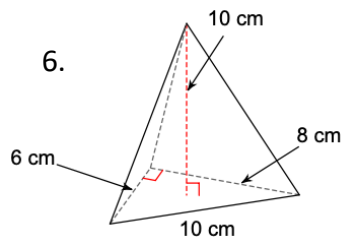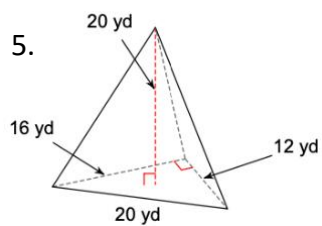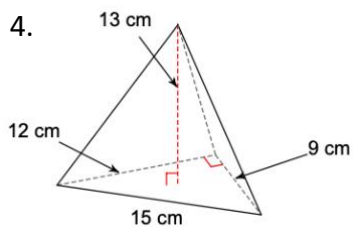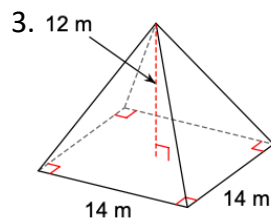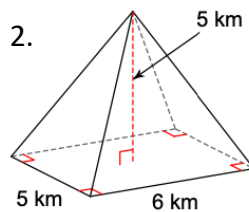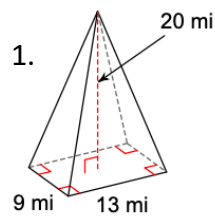## Section 18.1 – Volume of Prisms & Cylinders

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

1.

16 yd   12 yd

8 yd   8 yd

12 yd

2.

13 in   3 in

4 in

3 in   13 in

3.

9 mi

12 mi

14 mi

15 mi

4.

12 km   7 km

15 km

4.9 km

16 km

5.

17 cm

8 cm

6.

13 m

22 m
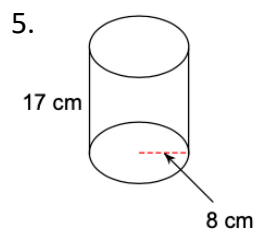
Section 18.2 – Volume of Pyramids

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

1.

20 mi

9 mi   13 mi

2.

5 km

5 km   6 km

3. 12 m

14 m   14 m

4.

13 cm

12 cm

9 cm

15 cm

5.

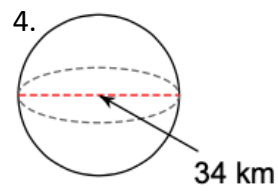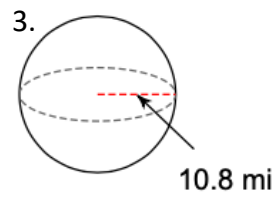20 yd

16 yd

12 yd

20 yd

6.

10 cm

6 cm

8 cm

10 cm

Section 18.3 – Volume of Cones

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

1.

38 m

19 m

2. 10 km

5 km

3.

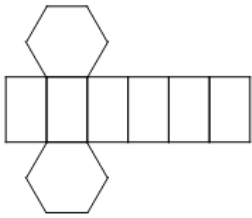15 mi

30 mi

4.

17 m

8 m

5. 14 mi

19 mi

6. 20 mi

16 mi
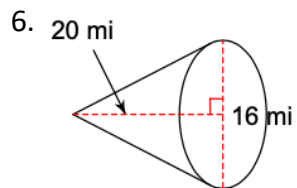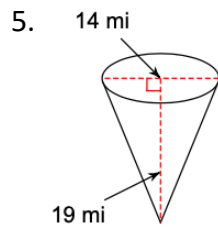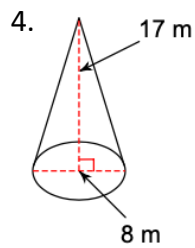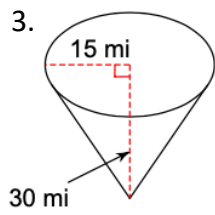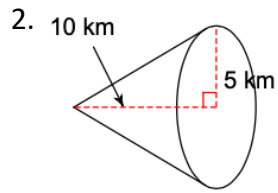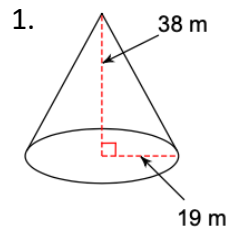
Section 18.4 – Volume of Spheres

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

1.

7 in

2.

18 yd

3.

10.8 mi

4.

34 km

5.

32.8 m
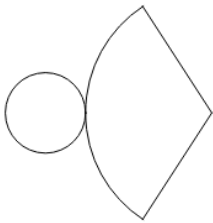
6.

37.4 ft
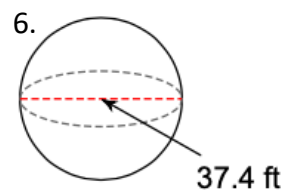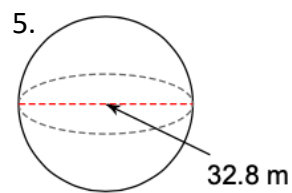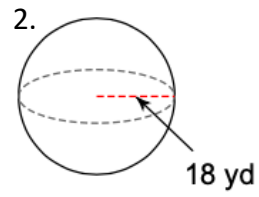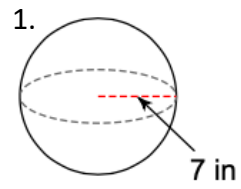
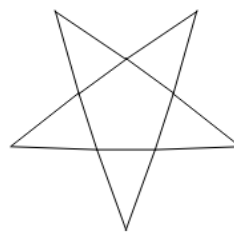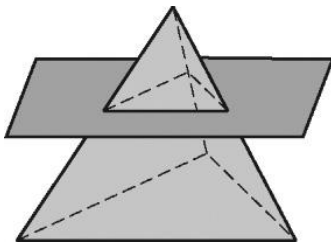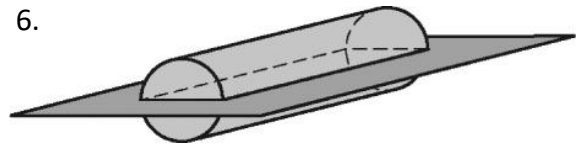**Identify what 3D shape is formed by the following nets.**
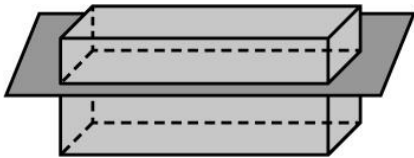
1.

2.
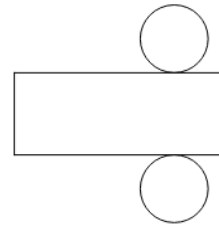
3.

4.

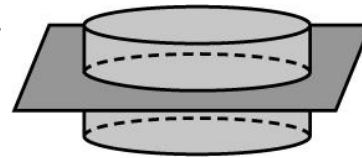**Describe each cross section of each figure.**
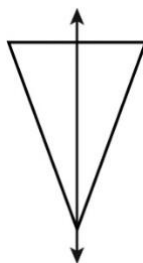
5.

6.

7.

8.

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

9.

10.

11.

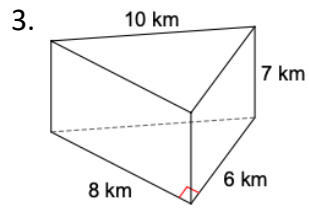**Find the lateral & surface area of the following prisms and cylinders.**

1.

7 ft   6 ft

11 ft

6 ft   7 ft

2.

3 in   3 in

3 in

3 in   3 in

3.

10 km

7 km

8 km   6 km

4.

10 m   4 m

3.6 m   7 m

11 m

5.

7 m

9 m

6.

12 mi

22 mi
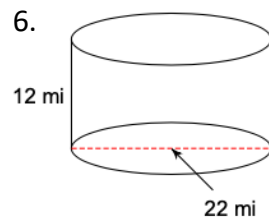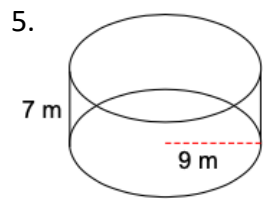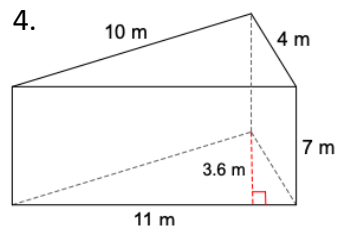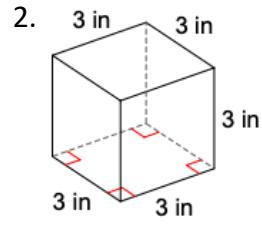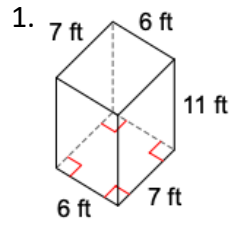
Section 19.3 – Surface Area of Pyramids & Cones

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

1.

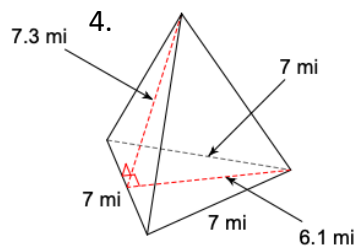
5.6 ft

5 ft   5 ft

2.

6.3 in

4 in   4 in

3.

8.4 yd

9 yd

9 yd

9 yd   7.8 yd

4.

7.3 mi

7 mi

7 mi

7 mi   6.1 mi

5.

17.9 m

8 m

6.

20.1 in

18 in
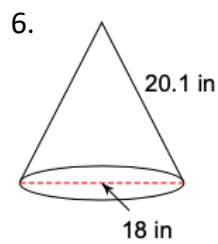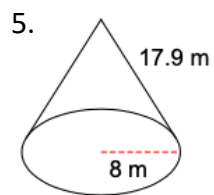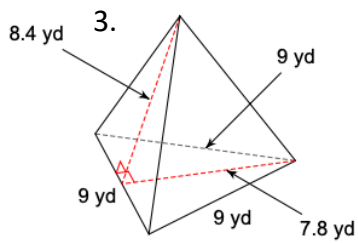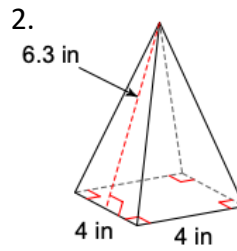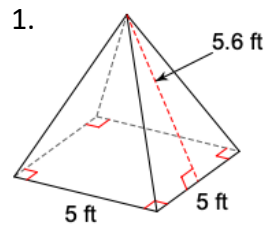
Section 19.4 – Surface Area of Spheres

Find the surface area of the following spheres.

1.

9 ft

2.

2 ft

3.

9.2 ft

4.

20 ft

5.

6.8 km

6.

8 in