ANALYTIC GEOMETRY

MIDTERM REVIEW GUIDE

Solve for the missing variable:

3.

49°
(9y - 4)°

4.

y° 40°

5.

(7y + 16)°
(3y + 24)°

7.

(3x + 1)°
(5x − 5)°

8.

120°
(3x)°

9.

135°
(3x + 15)°

10.

75°
(4x − 9)°

11.

80°
(5x - 15)°

12.

83°
(x − 13)°

13.

x + 37°   x + 67°
A

14.

S   U   Y
70°   ?
40°
T

15.

E   x + 1   F
3x − 4   2x + 1
G

1

16.

T (5x + 10)°   58°   S

(11x + 2)° U

A

17.

(8x +5)°

(5x -1)°

(4x +6)°

18.

2x + 5

x + 3

3x + 2
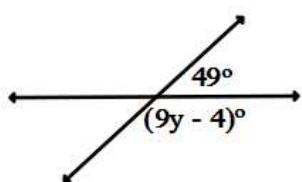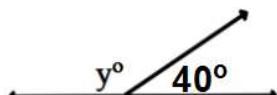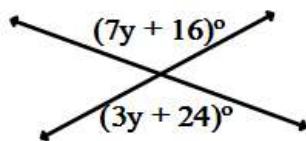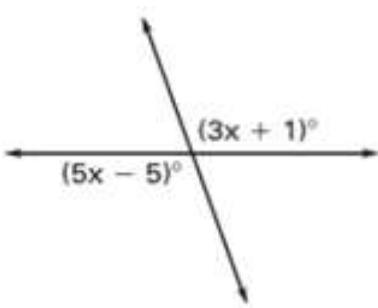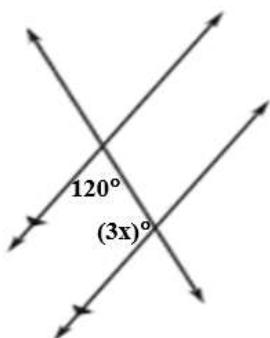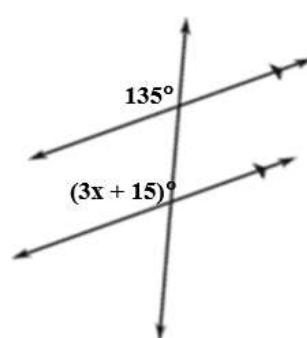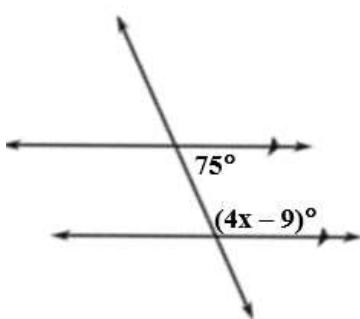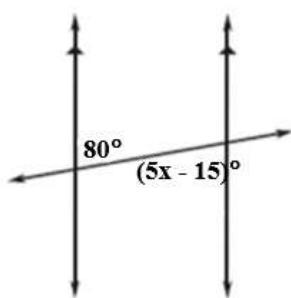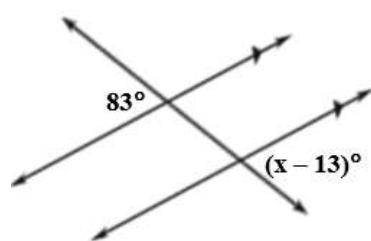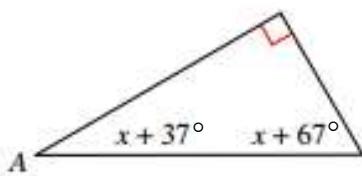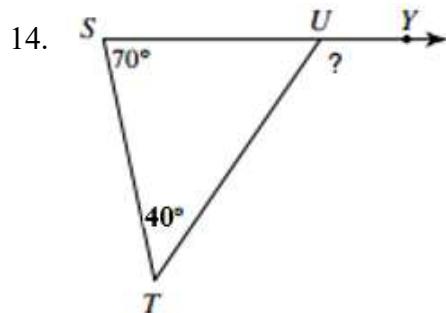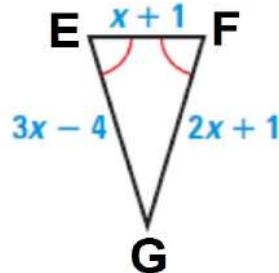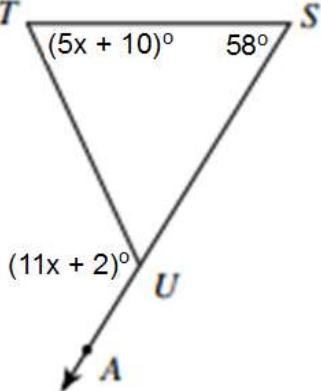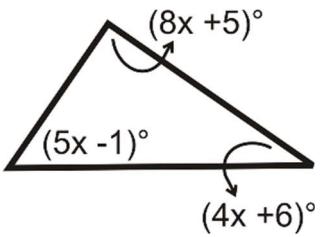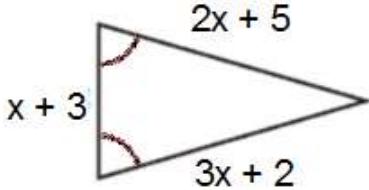
24. Are the triangles below similar? Why or Why not? Be sure to show your ratios if required.

a.

K
5 ft
3 ft
J   6 ft   L

I
10 ft   12 ft
H   7 ft   G

b.

B
8 cm   12 cm
A   16 cm   C

K
9 cm   6 cm
J   12 cm   L

c.

M   O

N

P   R

Q
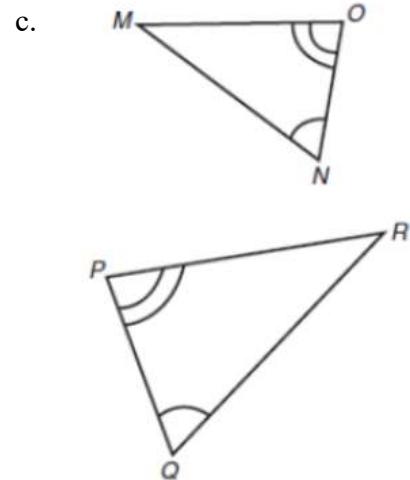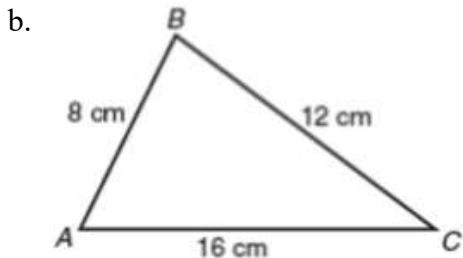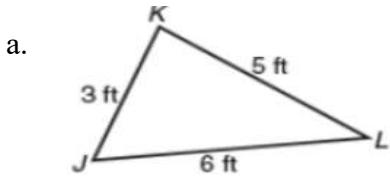
20. MP, MN, and PN are midsegments of ΔCDE. MP = 2, CD = 10, and PE = 6

PN // _____

MN = _____

DE = _____

PN = _____

C   M   D

P   N

E
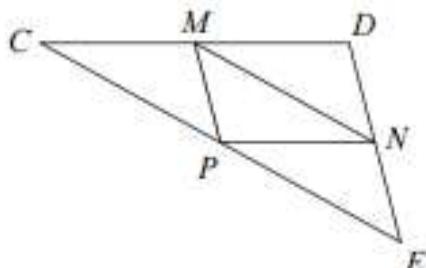
19. Find the length of UR.

R
Q   4
9   S
U   6
T
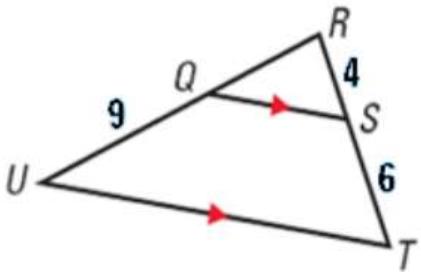
20. Find the length of AD.

A
20   16
B   C
X   9
D   E

2
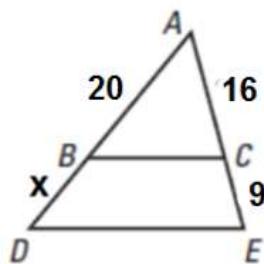
21. Identify the dilation and the scale factor of the following:

a.

Dilation: _____

Scale Factor: _____

16

6

b.

18   10
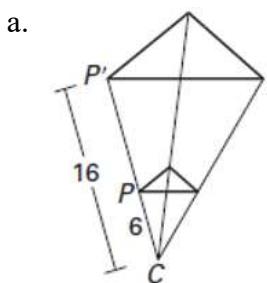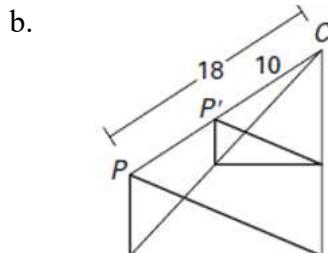
Dilation: _____

Scale Factor: _____

22. Given the following has a scale factor of k = 2, what would the new coordinates be?

A' _____

B' _____

C' _____

B(3, 3)

A(1, 2)

C(4, 1)
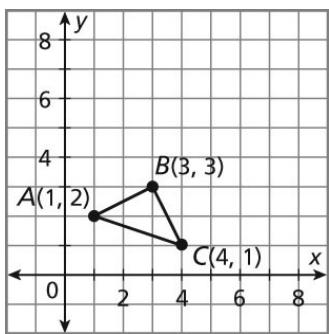
23. Given the following has a scale factor of k = ½ , what would the new coordinates be?

P(−6, 8)

Q(0, 6)

R(−4, 2)
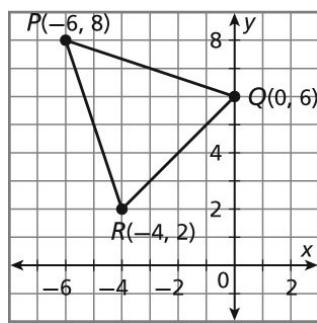
P' _____

Q' _____

R' _____

23. Identify the transformation that takes place. Be Specific… for example, what type of reflection, what type of transformation (left 2 up 1 for example), what type of rotation?

a.

B

A   C

B'

A'   C'

b.

A

B

C'   C

A'

B'

c.

B

A

C

C'

A

B'
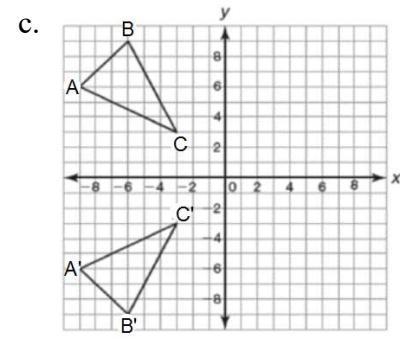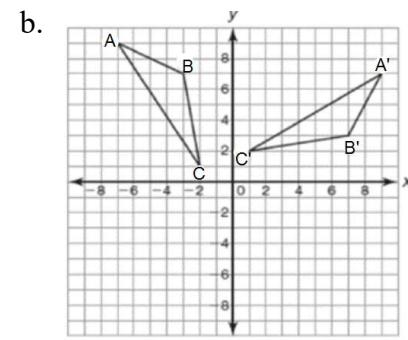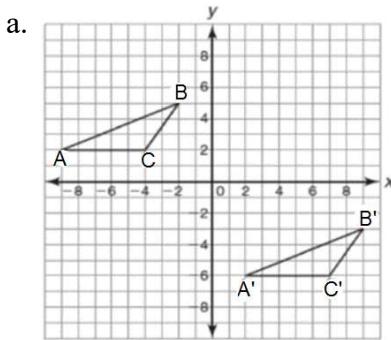
25. Are the triangles below congruent? Justify your answer:

a.

A

S

K

D

T

b.

X

Y

W

Z

c.

A

C

B

D

d.

A

D

B

C

e.

B

E

A   C   D

F

3
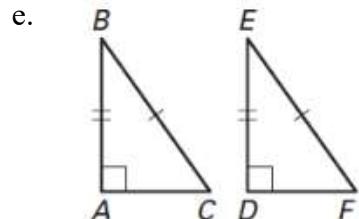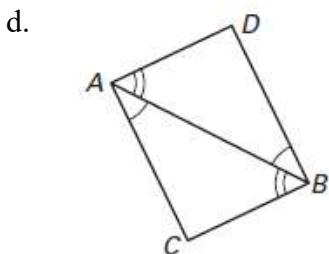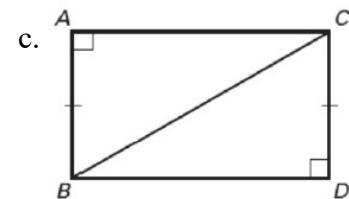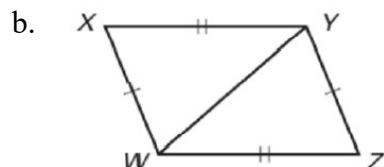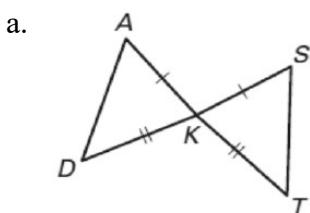
28. Use properties of quadrilaterals and parallelograms to find the missing variable(s):

a. Parallelogram

$(5x)°$

$(3x + 20)°$

b. Rectangle HIJK

H

I

$5x + 3$

$7x - 2$

K

J

c. Rectangle NMLK

N

M

$(2x - 10)°$

K

L

g. Rhombus

C

110°

$(9x + 25)°$ B

T

Y

h. Square

M

N

$3x + 14$

P

$5x - 8$

O
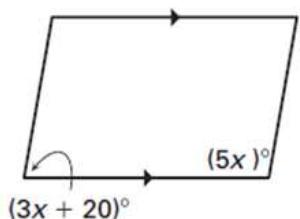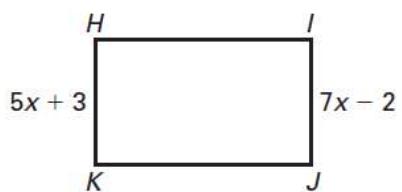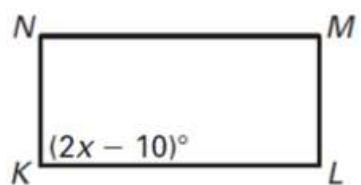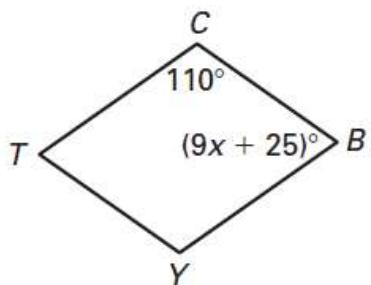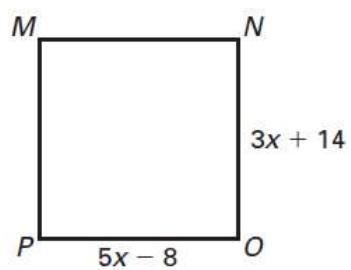
Construct an Angle Bisector:
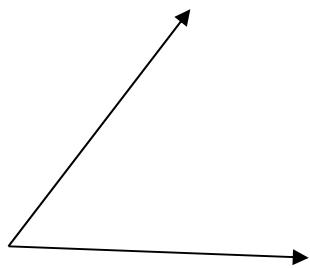
Construct a Perpendicular Bisector:

A

B

4
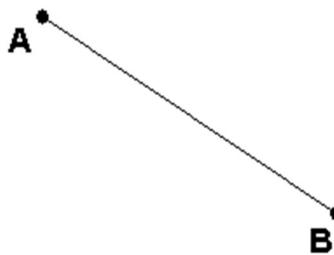
# UNIT 2 REVIEW FOR ANALYTIC GEOMETRY MIDTERM

Find the missing side or angle for each of the following: $\sin \theta = \dfrac{\text{opp}}{\text{hyp}}$ $\cos \theta = \dfrac{\text{adj}}{\text{hyp}}$ $\tan \theta = \dfrac{\text{opp}}{\text{adj}}$

1.

44°
8
?

2.

25 cm
θ
20 cm

3.

10
7
?°

4.

?
4
44°

5.

4
7
?°

6.

5
?
61°
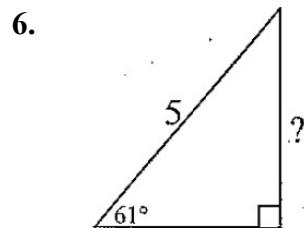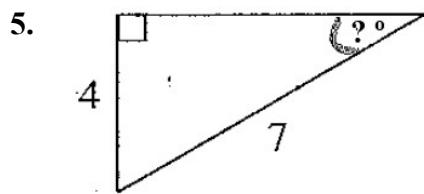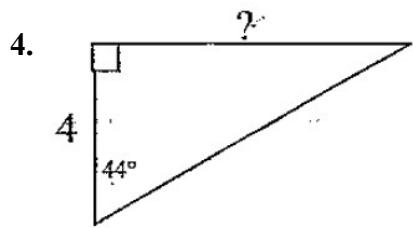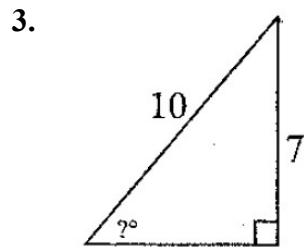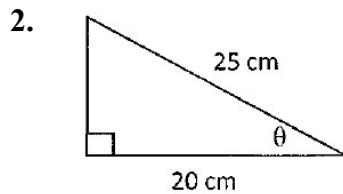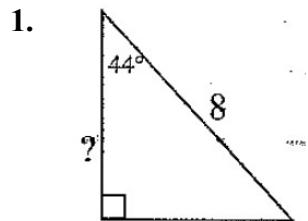
For 7-8 you will need to use the Pythagorean Theorem to find the missing side.

7.

C
13
5
A   X   B

8.

x
8
6

9.

21
X
15

10.

y
10
45°
x

11.

17 ft
x
75°

12.

Guy Line
X
30°
100 feet

5

13.

80 ft
?
43°

14.

120 ft
θ
65 ft

15.

18.5°
6000 ft
d
runway
beacon

Figure not drawn to scale
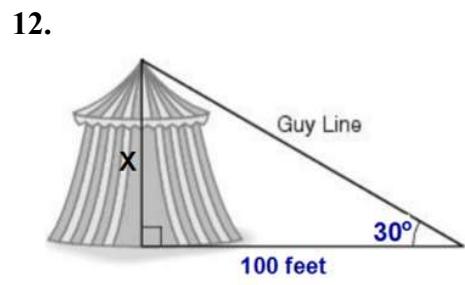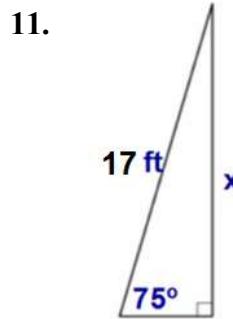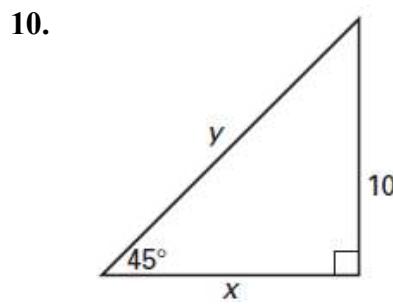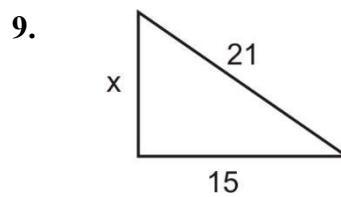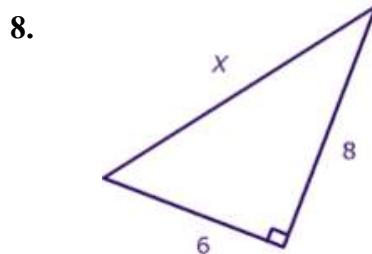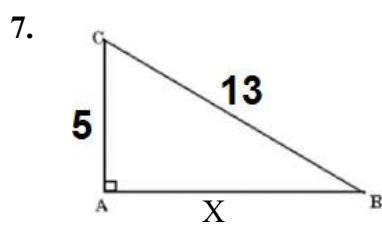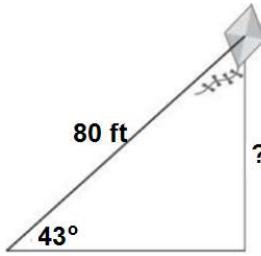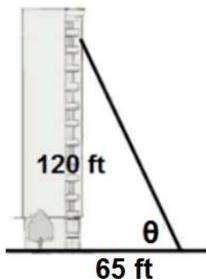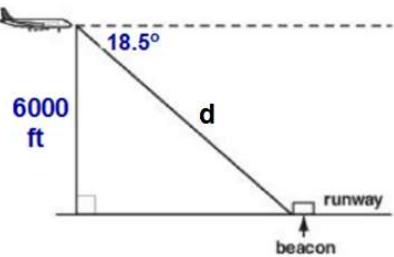
16. If the shadow of this building is 50 meters long when the angle of elevation to the sun is **30°** what is the approximate height, in meters, of the building?

30°
50 m
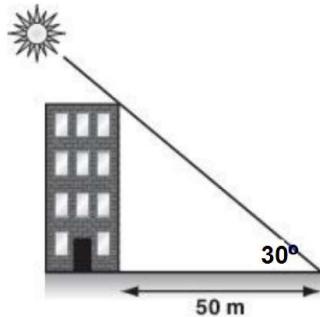
17. Find the following trigonometric ratios (simplify):

Sin Θ =

Cos Θ =

Tan Θ =

24 in
18 in
A
θ
30 in
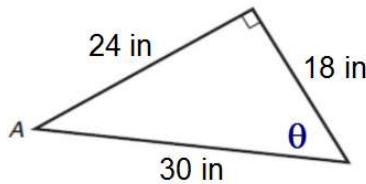
18. Given △ HIJ ~ △ KLM and sin (∠J) = 2/9, find sin (∠M)

19. If $\cos(x) = \sin(45°)$, what is the value of x? _____

20. If $\sin(x) = \cos(27°)$, what is the value of x? _____

21. If $\cos(x) = \sin(45°)$, what is the value of x? _____

6

Find the length of each arc:

1.

2.
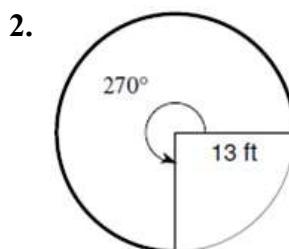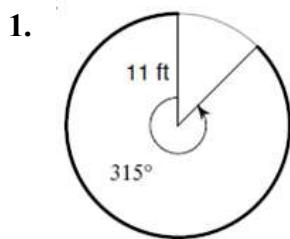
Arc Length of a Circle

$$\text{Arc Length} = \frac{2\pi r\theta}{360}$$

Area of a Sector of a Circle

$$\text{Area of Sector} = \frac{\pi r^2\theta}{360}$$

Find the area of each sector:

3.

4.
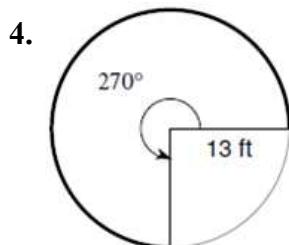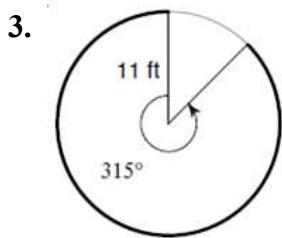
Volume

Cylinder $V = \pi r^2 h$

Pyramid $V = \frac{1}{3}Bh$

Cone $V = \frac{1}{3}\pi r^2 h$

Sphere $V = \frac{4}{3}\pi r^3$

Find the Volume of the following:

5.

4 in.

6.   2 km

3 km

7.   5 yd

3 yd   3 yd

8.

8 ft

24 ft

9.   3 in

4 in

10.

18 ft

11.

6 m

13 m

12.

10

16
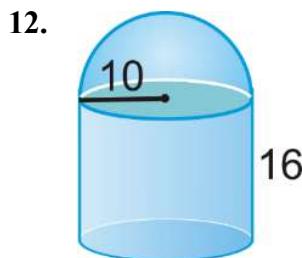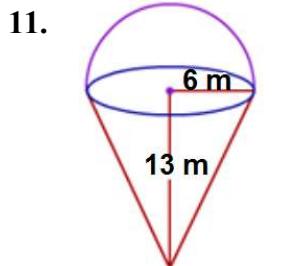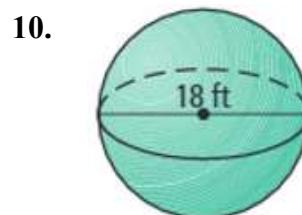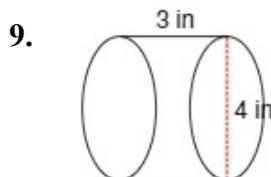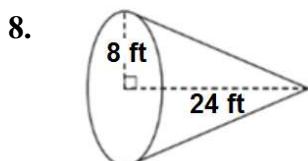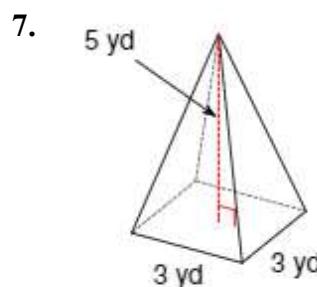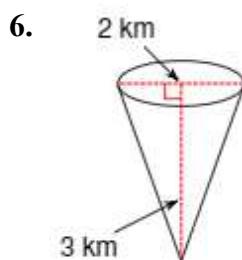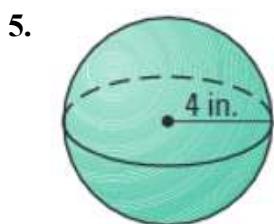
13. Given Cylinder 1 and Cylinder 2 have the same height and the same radius what woud you know about their volume? (Would cylinder 1's volume be greater or less than the volume of cylinder 2 or would it be exactly the same?)

15"

MathBits

Find the missing value:

14.

$2x + 5$

B
C
D
A
33

15.

B
A
$40°$
$x°$
C

16.

$182°$
$70°$
$x°$

17.

x
7
9

18.

A
$75°$
$85°$
B
$x°$
$y°$
D
C

19.

$80°$
C
B
$?$
A

20.

$83°$
$x°$
$107°$

21.

5
X
3
4

22.

15
9
X

8

23.

x · 8 = 5 · 4

24.

25. 152°   x°   60°

26.

x   6   4   3

27.

B   5x − 4

C•   →A

3x + 6   D

28.

38°   x°

108°
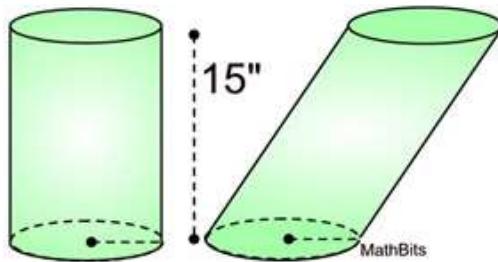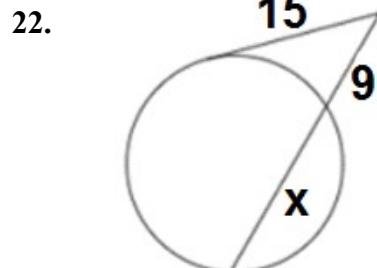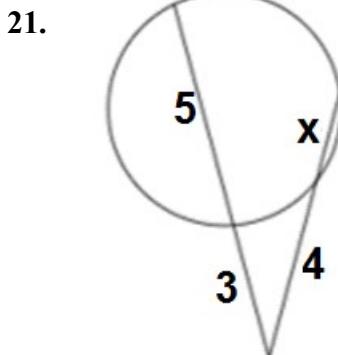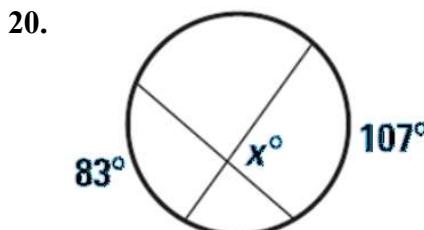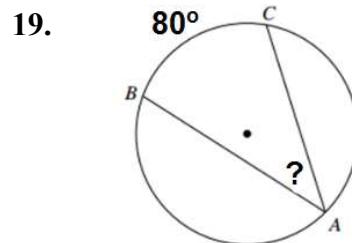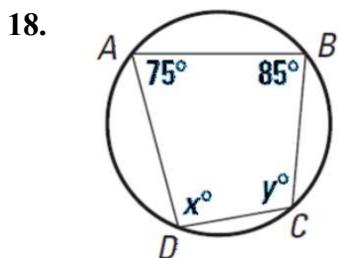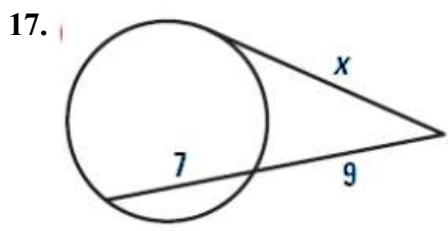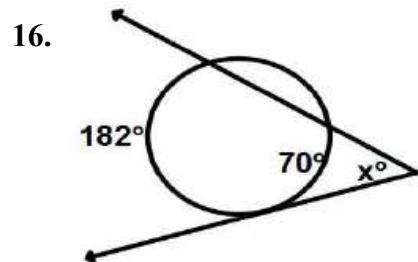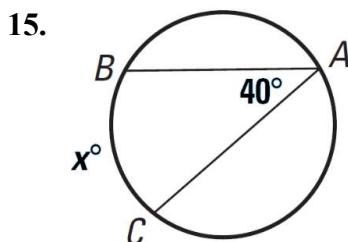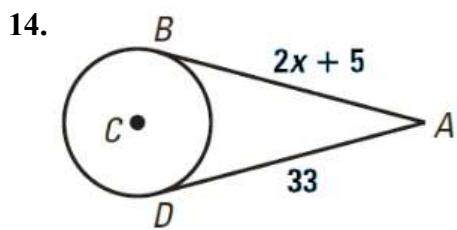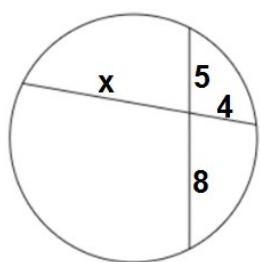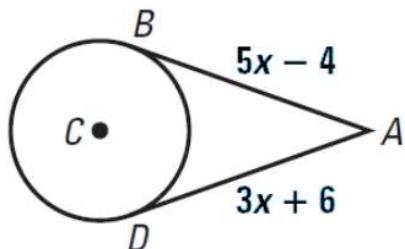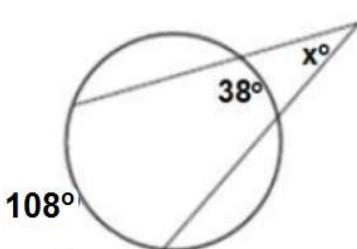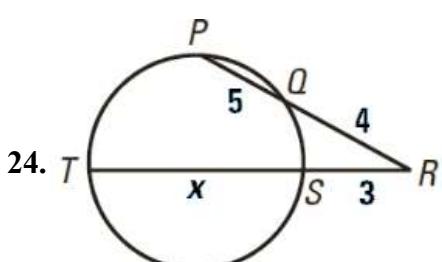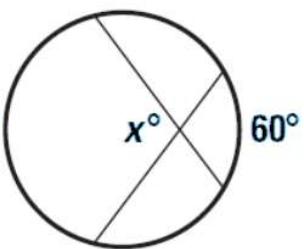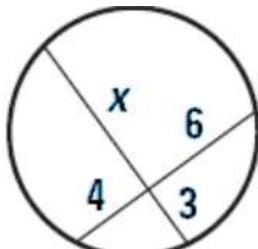
29. Find the measure of the following:

m $\overset{\frown}{AE}$ = _____

m $\overset{\frown}{AB}$ = _____

m $\overset{\frown}{ABC}$ = _____

m $\overset{\frown}{EC}$ = _____

A

E   70°   F   B
   45°   70°

D   C

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1. $(7x + 4) + (3x - 6)$ **2.** $(3x - 3)(3x + 8)$ **3.** $(8x^2 - 7x + 8) - (-3x^2 + 7x - 2)$

4. Find the perimeter:

3x + 7

2x + 1   2x + 1

3x + 7

5. Find the area:

2x + 5

2x + 5

6. Find the area:

$x^2 + 2x + 3$

x + 4

7. Find the volume:

x + 5

x + 5

x + 5
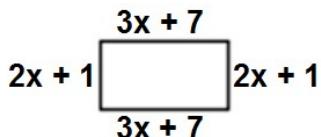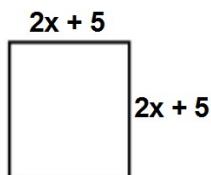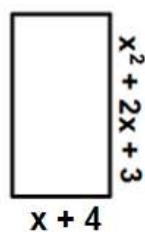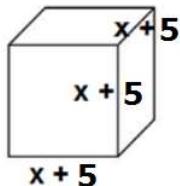
Simplify the following Radicals:

8. $\sqrt{27}$ **9.** $\sqrt{32}$ **10.** $\sqrt{24}$ **11.** $\dfrac{8}{\sqrt{5}}$ **12.** $\dfrac{7}{\sqrt{3}}$ **13.** $\dfrac{8}{3\sqrt{2}}$

10

14. $-8\sqrt{5} - 12\sqrt{5}$

15. $2\sqrt{3} + 4\sqrt{27}$

16. $\sqrt{12} * \sqrt{8}$

17. $3\sqrt{11} + 9\sqrt{11}$

18. $2\sqrt{2} + 2\sqrt{8}$

19. $\sqrt{25} * \sqrt{2}$

20. What will be the end result when an irrational number is multiplied by a nonzero rational number?

21. What will be the end result when a rational number is multiplied to another rational number?

22. What will be the end result when a rational number is added to another rational number?

Identify the following as rational or irrational:

23. $\dfrac{\pi}{\pi}$

24. $\dfrac{2\sqrt{2}}{3} * \dfrac{4}{\sqrt{2}}$

25. $3 + 0.111...$

26. $\sqrt{81} * \sqrt{25}$

27. $\sqrt{5} + 0.\overline{5}$

28. $25.123685841...$

29. π

30. $-\sqrt{5} + \sqrt{5}$

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