Name: **Key**

Midterm (Cumulative) Review

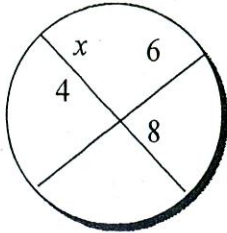**Unit 4 Circle Segments and Volume**

1. What is the length of x?

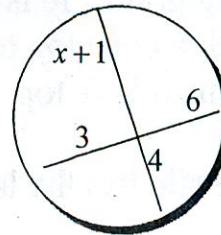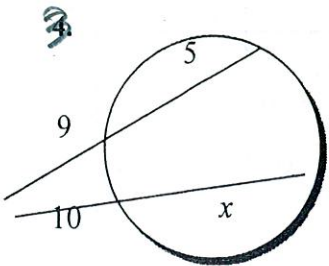A. 6   B. 4.25   C. 1   D. 7

Solve for x. If necessary, round your answer to the nearest tenth.

1.
x 6
4
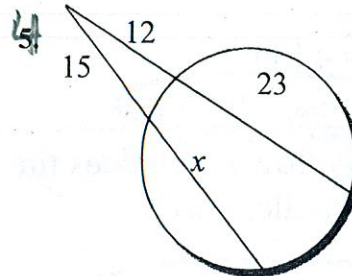8
$X=3$

2.
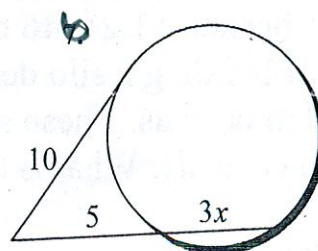$x+1$
6
3
4
$X=3.5$

3.
5
9
10
x
$X=2.6$
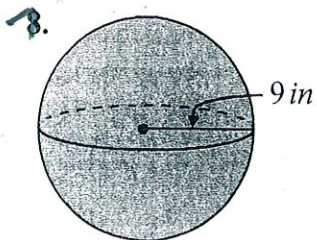
4.
12
15
23
x
$X=13$

5.
x
5
4
$X=6$
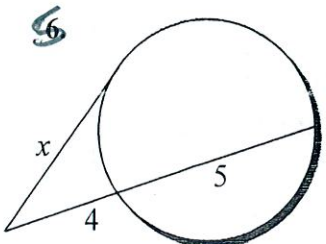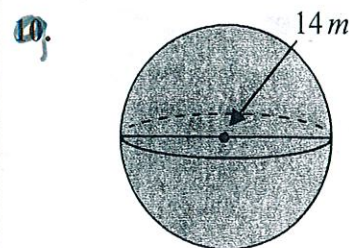
6.
10
5
$3x$
$X=5$

Find the volume of the sphere.

7.
9 in
3053.63

9. A bowling ball has a diameter of 8 inches. Find its volume.

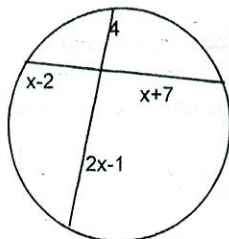a) 85.33 in³
b) 268.08 in³
c) 2143.57 in³
d) 1071.79 in³

10.
14 m
1436.76

10 Find the value of x.

A. 8
B. -2
C. -5
D. 5

x-2
4
x+7
2x-1

12.

4. A farmer is building a new silo for storing grain. He is comparing a silo with a cone top to a silo with a hemisphere top.

9 ft.

60 ft.

a) Which silo has the larger volume?
Choose:
○ cone top
(○ hemisphere top)

18 ft.   18 ft.
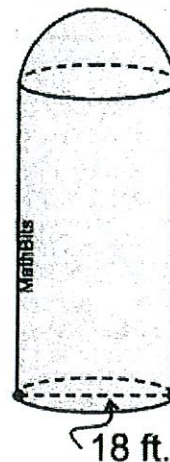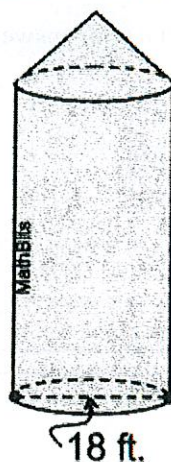
b) By how much does the volume of the larger silo exceed that of the smaller silo?

13. Choose:
(○ 763.407 cubic ft.)   ○ 2290.222 cubic ft
○ 3053.638 cubic ft.   ○ 5368.144 cubic ft.

c) *Note:* 1 bushel = 1.24446 cubic feet
The cost of building a silo depends upon its holding capacity expressed in bushels. These silos fall into the price range of $2.21 per bushel capacity. What is the cost of the smaller silo?
Choose:
○ $12,882.33   ○ $22,560.85
○ $28,469.95   ○ $44,090.87

d) How much more will it cost to construct the larger silo?
14. Choose:
○ $2,099.57   ○ $1,687.13
○ $1,403.83   ○ $1,355.71

2

16. Use the figure to solve for x.

A. 6
B. 1
C. 11
D. 7
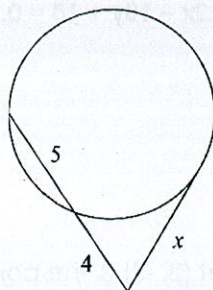
17. Use the figure to solve for x.

A. 10
B. 3
C. 12
D. 9
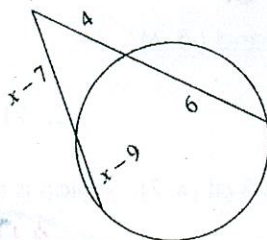
$17)\ 4(4+4) = x-7(x-7+x-9)$
$4(10) = x-7(2x-16)$
$40 = 2x^2 -16x -14x + 112$
$0 = 2x^2 - 30x + 72$
$0 = 2(x^2 - 15x + 36)$
$0 = 2(x - 12)(x - 3)$
$\boxed{x = 12}$ $x = 3$

18. Use the figure to solve for x.

A. 12
B. 11
C. 3
D. 0
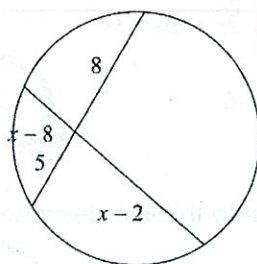
Unit 5 Algebraic Connections to Geometry

1. Which equation is graphed to the right?:

A. $x^2 + y^2 = 8$
B. $x^2 + y^2 = 16$
C. $9x^2 + 9y^2 = 576$
D. $9x^2 - 9y^2 = 576$
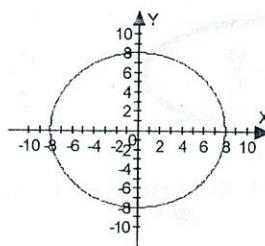
2. Find the equation of a line tangent to the circle $x^2 + y^2 = 8$ at the point (2, 2).

A. $y = -x + 4$
B. $y = -x - 4$
C. $y = x - 4$
D. $y = -\frac{1}{2}x + 4$

3. At what point(s) does the line $x - y - 2 = 0$ intercept the circle $(x - 3)^2 + (y+4)^2 = 53$?

A. (5, 3) & (-4, -6)
B. (3, 5) & (-6, -4)
C. (-4, 5)
D. (5, 4)

3

4. Find the center and the radius of $x^2 + y^2 + 2x - 10y + 10 = 0$.

    A. center $(1, -5)$; $r = 16$
    B. center $(1, -5)$; $r = 4$
    C. center $(-1, 5)$; $r = 16$
    D. center $(-1, 5)$; $r = 4$

5. Find an equation for a circle with center at $(3, -3)$ & the point $(3, 1)$ is on the circle.
$(x-3)^2 + (y+3)^2 = r^2$
$4^2 = r^2$

$$(x-3)^2 + (y+3)^2 = 16$$

6. What is the distance between the points $(7, -3)$ and $(-5, 6)$

    A. 4   B. 9   C. 21   D. 15

7. A line passes through point A at $(2, 3)$ and point B at $(4, 7)$. Which is the equation of $\overrightarrow{BC}$ if $\overrightarrow{AB} \perp \overrightarrow{BC}$? Use slope + B(4,7)

    A. $y = -2x + 5$ $\dfrac{7-3}{4-2} = \dfrac{4}{2}$ B. $y = -\dfrac{1}{2}x + 5$ $3 \neq 4$

    $\perp: -\dfrac{1}{2}$ $7 \neq 8$

    C. $y = -\dfrac{1}{2}x + 9$ D. $y = \dfrac{1}{2}x + 5$

    $3 \neq 8$ $7 = 7$

8. Which line is parallel to the line described by $2x + 3y = 6$?

    A. $3x + 2y = 6$ B. $3x - 2y = -6$ C. $2x + 3y = -6$ D. $2x - 3y = 6$

9. Which function's graph is NOT perpendicular to the line described by $4x - y = -2$?

    A. $y + \dfrac{1}{4}x = 0$ B. $\dfrac{1}{2}x = 10 - 2y$ C. $3y = \dfrac{3}{4}x + 3$ D. $y = -\dfrac{1}{4}x + \dfrac{3}{2}$

10. Which equation describes a line perpendicular to $y = 8x - 9$ that passes through the point $(9, -9)$?

    A. $y = 8x - 81$ B. $y = -\dfrac{1}{8}x - \dfrac{63}{8}$ C. $y = 8x - 9$ D. $y = -\dfrac{1}{8}x + \dfrac{585}{8}$

11. Point P is on the line segment from point $A(-11, 4)$ to point $B(-1, -6)$ and divides the segment in the ratio 1 to 3. Which could be the coordinates of P?

    A. $(-6, -1)$ C. $\left(-\dfrac{7}{2}, -\dfrac{7}{2}\right)$ $*(-8.5, 1.5)$ 4 parts

    B. $(-3, -4)$ D. $\left(-\dfrac{9}{5}, -\dfrac{2}{5}\right)$

12. What is the area of the polygon formed by the points $A(-4, 2)$, $B(1, 2)$, $C(1, -2)$, and $D(-4, -2)$?

    A. 18 units^2 B. 19 units^2 C. 20 units^2 D. 30 units^2

13. What is the perimeter of the polygon formed by the points $P(-4, 1)$, $Q(2, 4)$, $R(4, 0)$, $S(-2, -3)$?

    A. $10\sqrt{5}$ units   B. 18 units   C. $9\sqrt{5}$ units   D. 20 units

14. What are the coordinates of the midpoints of $\overline{BL}$ with endpoints B(-7, -4) and L(2, 3)?
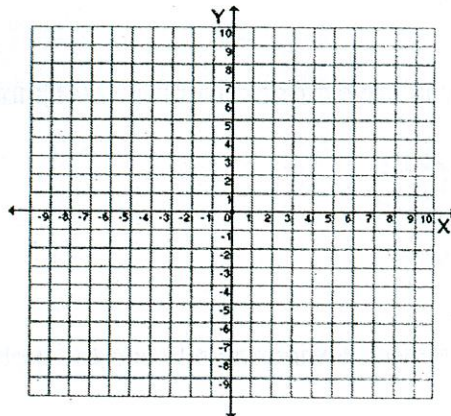
A. $\left(-3\frac{1}{2}, -1\frac{1}{2}\right)$.
B. $\left(-2\frac{1}{2}, -\frac{1}{2}\right)$
C. $\left(-1\frac{1}{2}, 0\right)$
D. $(-5, -1)$

15. What type of quadrilateral do the points A(-3, 5), B(2, 7), C(2, 3), and D(-3, 1) form? Explain your reasoning.

$\parallel$ gram

opp sides $\parallel$

16. A signal from a radio transmitter can be received up to 175miles away. The following points represent locations of houses near the transmitter if the transmitter is at the origin. Which point is not within range of the transmitter?

A. (40, 120)
B. (90, 150)
C. (55, 185)
D. (60, 125)

18. A given circle has a radius of 6 and is centered at the origin. The line x = 3 intercepts the circle and forms a chord. What is the length of the chord? Round your answer to the nearest tenth.

A. 5.2
C. 6.0
B. 3.0
D. 10.4

$x^2 + y^2 = 36$ $y \approx 5.2$
$9 + y^2 = 36$ $(3, 5.2)$
$y^2 = 27$ $(3, -5.2)$

19. Three coordinate points of a parallelogram are $(2,1), (4,4)$ and $(7,4)$. Find the fourth vertex.

A. (5,1)
B. (2,7)
C. (5,4)
D. (5,7)

20. What special type of quadrilateral has the vertices $A(-2,1)$, $B(2,-3)$, $C(2,1)$, and $D(-2,-3)$?

A. Rhombus
B. Square
C. Rectangle
D. Parallelogram

5

1. A box contains 4 green tiles, 8 white tiles, and 10 red tiles. Manuel will reach into the bag and select a tile without looking. What is the probability that he will select either a green tile or a red tile?

A. 7/11
B. 52/271
C. 20/231
D. 10/121

2. If you have a deck of cards, what is the probability that you will draw a 9 or a heart?

A. 17/52
B. 4/13
C. 1/52
D. 1/26

3. Use the following table to find the probability that a student has a cell phone and is from school B.

A. 0.21
B. 0.41
C. 0.62
D. 0.85

	Students who have a cell phone	Students who do not have a cell phone	Total
School A	365	156	521
School B	408	71	479
Total	773	227	1000

4. In a game, discs are thrown into two circles from one side of the room. The results are shown below. Let Event A = landing in Circle 1 and Event B = landing in Circle 2.
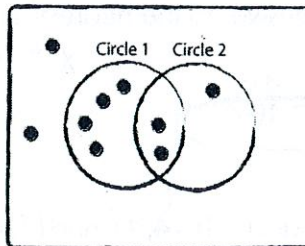
Find the following probabilities:

$\frac{2}{3}$ a. P(A) $\frac{6}{9}$

$\frac{1}{3}$ b. P(B) $\frac{3}{9}$

$\frac{2}{9}$ c. P(A ∩ B)

$\frac{7}{9}$ d. P(A ∪ B)

$\frac{1}{3}$ e. P(A)' $\frac{3}{9}$

$\frac{2}{9}$ f. P(A ∪ B)'

5. A bag contains 4 red marbles, 3 blue marbles, and 2 green marbles. What is the probability that Brandon reached into the bag and picked a red marble if you know he did NOT pick a green marble?

A. 1/8
B. 4/9
C. 4/7
D. 7/9

6

6. In your class, 56% of the students get an allowance and 41% of the students who get an allowance also do household chores. What is the probability that a student in your class does household chores given that the student gets an allowance?

A. 67%
B. 9%
C. 73%
D. 75%

7. Use the following table to calculate the probability that a randomly selected student has a cell phone given that the student attends School B.

A. 0.21
B. 0.41
C. 0.62
D. 0.85

	Students who have a cell phone	Students who do not have a cell phone	Total
School A	365	156	521
School B	408	71	479
Total	773	227	1000

8. Using the table below, answer the following questions:

	Math	Science	English	History	
Male	46	42	13	25	126
Female	12	21	45	36	114
	58	63	58	61	240

23/63 a. What is the probability that a student likes math given they are a male?
46/126

_____ b. What is the probability that a student is female given they like English or Science?
66/121

_____ c. What is the probability that a student is male given they do not like History?
101/179

9. A drawer contains 3 red socks, 5 white socks, and 7 blue socks. Without looking, you draw out a sock and then draw out a second sock without returning the first one to the drawer. What is the probability that both socks are blue?

A. 1/5
B. 1/9
C. 2/21
D. 49/225

10. An aquarium contains 3 female fish and 6 male fish. What is the probability of catching a male fish, then a female fish, and then another male fish, if you put each fish back in the aquarium before catching another one?

A. 4/3
B. 5/3
C. 8/27
D. 4/27

7

11. A bag contains 5 red marbles, 3 yellow marbles, and 2 blue marbles. Once a marble is drawn, it is not replaced. What is the probability of drawing a blue marble on the first draw and a second blue marble on the next draw?

A. 1/50
B. 1/45
C. 2/25
D. 28/90

12. Which of the following events are independent given P(A), P(B), and P(A and B)?

A. P(A) = 0.16; P(B) = 0.24, P(A and B) = 0.38
B. P(A) = 0.08; P(B) = 0.4, P(A and B) = 0.12
C. P(A) = 0.25; P(B) = 0.25, P(A and B) = 0.0625
D. P(A) = 0.3; P(B) = 0.15, P(A and B) = 0.45

13. A jar contains 4 white chips, 5 purple chips, and 1 black chip. Chips are selected randomly one at a time. Find the probability of the following:

$\frac{1}{18}$ a. P(purple and black); chip is not replaced

$$\frac{5}{10} \cdot \frac{1}{9}$$

$\frac{2}{45}$ b. P(black and white); chip is **not** replaced

$$\frac{1}{10} \cdot \frac{4}{9}$$

$\frac{1}{50}$ e. P(white, purple, and black); chip is replaced

$$\frac{4}{10} \cdot \frac{5}{10} \cdot \frac{1}{10}$$

$\frac{1}{100}$ c. P(2 black chips); chip is replaced

$$\frac{1}{10} \cdot \frac{1}{10}$$

0 d. P(white and orange); chip is replaced

$$\frac{4}{10} \cdot 0 = 0$$

$\frac{1}{30}$ f. P(3 whites); chip is **not** replaced

$$\frac{4}{10} \cdot \frac{3}{9} \cdot \frac{2}{8}$$