

Semester 2 Final Review

Write the quadratic equation for the following.

6.2

- 1) x - intercepts of (7, 0) and (-3, 0) and passes through the point (0, 1).

$$y = \frac{-1}{21}(x-7)(x+3)$$

- 2) x - intercepts of (-4, 0) and (6, 0) and passes through the point (-3, 2).

$$y = \frac{-2}{9}(x+4)(x-6)$$

- 3) Vertex: (1, -2) and passes through the point (0, 16)

$$y = 18(x-1)^2 - 2$$

- 4) Vertex: (2, 10) and passes through the point (-1, 6)

$$y = \frac{-4}{9}(x-2)^2 + 10$$

6.1

- 5) A diver is standing on a platform 28 feet above the pool. Their jump from the pool can be represented by the equation: $h = -16t^2 + 6t + 28$, where h is their height above the water, and t is the time. (Decimals are okay!)

- a) When will the diver reach their maximum height?

0.19 seconds

- b) What is their maximum height?

28.56 feet

- c) How high will they be at 0.5 seconds? At 1 seconds?

27 feet, 18 feet

- d) How long will it take them to splash into the water?

1.52 seconds

6.1 6) A baseball is being thrown from the top of a hill to a friend at the bottom of the hill. The equation that models the curve the ball takes can be expressed by: $h = -6.6t^2 + 21.4t + 63.4$. Use this information to answer the following questions.

a) What is the starting height of the baseball?

63.4 feet

b) When will the ball reach its maximum height?

1.62 seconds

c) What is the maximum height the ball will reach?

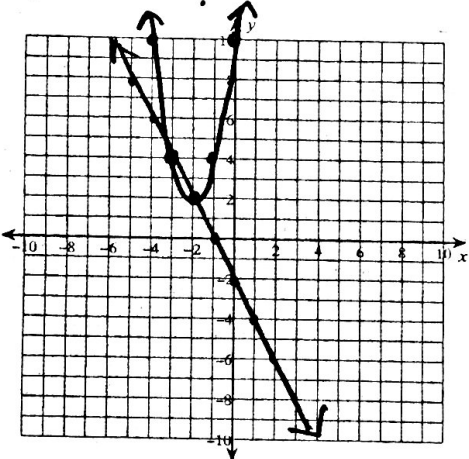
80.75 feet

d) When will the ball hit the ground?

5.12 seconds

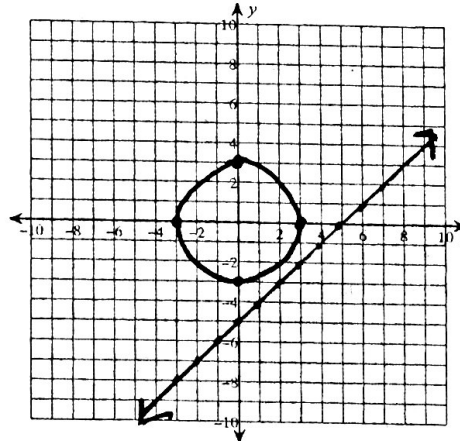
Solve the following systems by graphing.

7.3 7) $y = 2x^2 + 8x + 10$
 $y = -2x - 2$



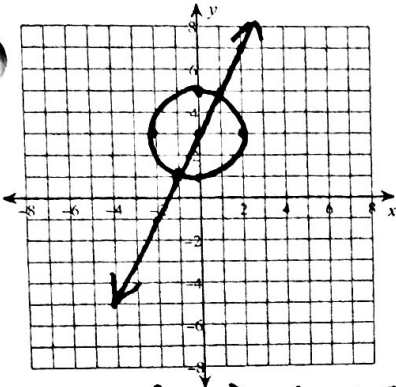
$(-3, 4), (-2, 2)$

8) $x^2 + y^2 = 9$
 $y = x - 5$



No Solution

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

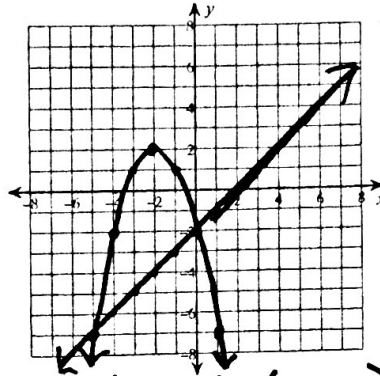


Approx: $(-1, 1), (1, 4.8)$

7.1 11) $y = x^2 - x - 12$
 $y = x + 3$

$(-3, 0), (5, 8)$

10) $y = -x^2 - 4x - 2$
 $y = x - 2$



$(-5, -7), (0, -2)$

12) $y = x^2 + 4x + 3$
 $y = 2x + 6$

$(-3, 0), (-1, 4)$

Identify the center and radius of each.

7.2 13) $(x - 4)^2 + (y - 13)^2 = 9$
 $C: (4, 13)$
 $r = 3$

14) $(x - 3)^2 + (y - 1)^2 = 64$
 $C: (3, 1)$
 $r = 8$

Use the information provided to write the equation of each circle.

7.2 15) Center: $(-6, -10)$
 Radius: 5
 $(x + 6)^2 + (y + 10)^2 = 25$

16) Center: $(-8, -13)$
 Radius: 4
 $(x + 8)^2 + (y + 13)^2 = 16$

- 17) Center: (16, 13)
Point on Circle: (18, 15)

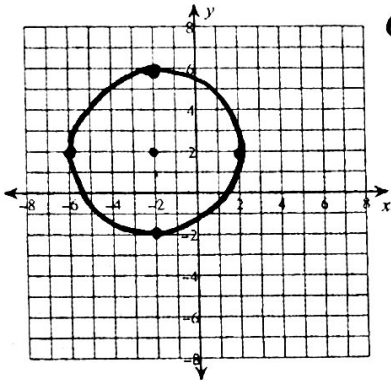
$$(x-16)^2 + (y-13)^2 = 8$$

- 18) Center: (1, 13)
Point on Circle: (2, 10)

$$(x-1)^2 + (y-13)^2 = 10$$

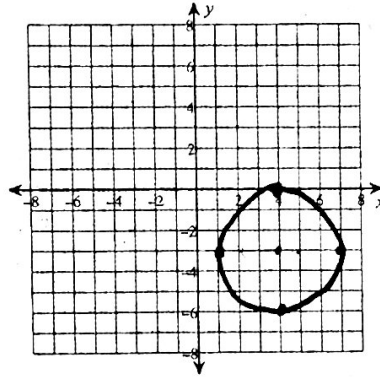
Identify the center and radius of each. Then sketch the graph.

7.2 19) $(x+2)^2 + (y-2)^2 = 16$



C: (-2, 2)
r = 4

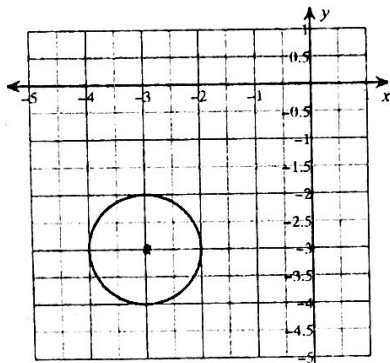
20) $(x-4)^2 + (y+3)^2 = 9$



C: (4, -3)
r = 3

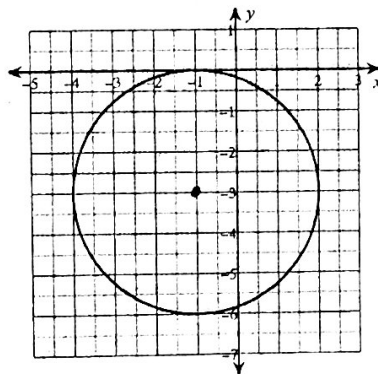
Use the information provided to write the equation of each circle.

7.2 21)



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

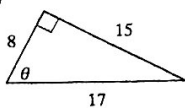
22)



$$(x+1)^2 + (y+3)^2 = 9$$

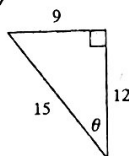
Find the value of the trig function indicated.

11.1 23) $\sin \theta$



$$\frac{15}{17}$$

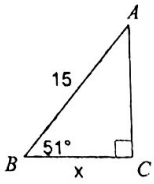
24) $\tan \theta$



$$\frac{3}{4}$$

Find the measure of each side indicated. Round to the nearest hundredth.

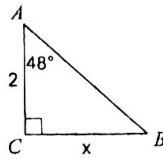
25)



11.2

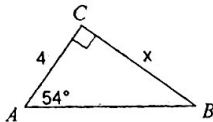
9.44

26)



2.22

27)



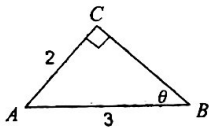
5.51

28) Find the shadow cast by a 10 foot lamp post when the angle of elevation of the sun is 58° . Find the length to the nearest tenth of a foot.

6.2 ft

Find the measure of each angle indicated. Round to the nearest hundredth.

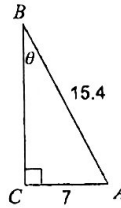
29)



11.3

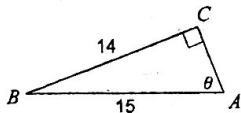
41.81°

30)



27.04°

31)



68.96°

32) A ladder leans against a brick wall. The foot of the ladder is 6 feet from the wall. The ladder reaches a height of 15 feet on the wall. Find to the nearest degree, the angle the ladder makes with the wall.

68°

Transform the given function $f(x)$ as described and write the resulting function as an equation.

- 8.1 33) $f(x) = x^2$
 translate right 1 unit
 translate up 1 unit

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

- 34) $f(x) = |x|$
 translate left 3 units
 translate down 3 units

$$y = |x+3| - 3$$

Describe the transformations necessary to transform the graph of $f(x)$ into that of $g(x)$.

- 8.1 35) $f(x) = |x|$
 $g(x) = 3|x| + 3$

Vertical stretch of 3
 Vertical shift up 3

- 36) $f(x) = x^2$
 $g(x) = \frac{1}{3}(x+1)^2$

Vertical compression of $\frac{1}{3}$
 Horizontal shift left 1

For each problem, find the average rate of change of the function over the given interval.

- 8.2 37) $y = 2x^2 + 2x + 2$; $[0, \frac{1}{2}]$

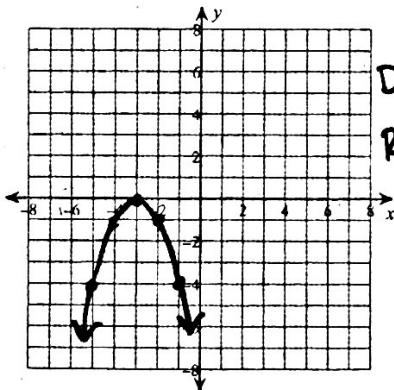
3

- 38) $y = 2x^2 + x + 2$; $[-1, 1]$

1

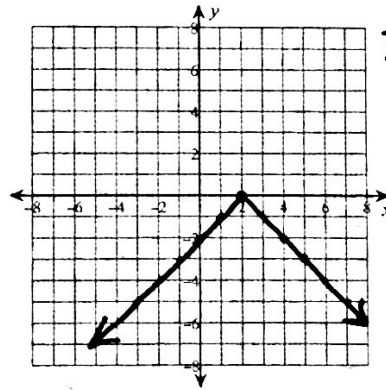
Sketch the graph of each function. Then state the domain and range.

- 8.1 39) $g(x) = -(x+3)^2$



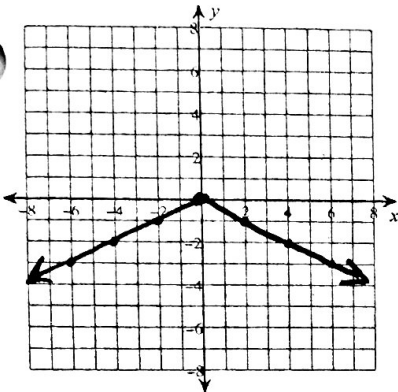
D: $(-\infty, \infty)$
 R: $(-\infty, 0]$

- 40) $g(x) = -|x-2|$

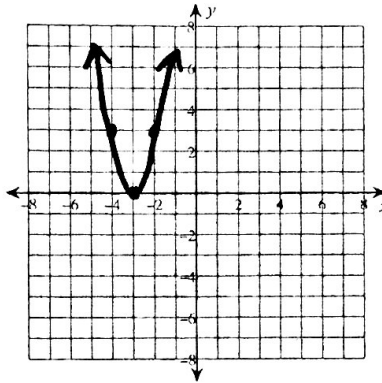


D: $(-\infty, \infty)$
 R: $(-\infty, 0]$

41) $g(x) = -\frac{1}{2} \cdot |x|$



42) $g(x) = 3(x + 3)^2$



8.4 43) Name the kinds of functions (linear, quadratic, exponential) that have the slowest and the fastest growth rate.

Slowest: Linear

Fastest: Exponential

8.4 Make each set of coordinates into a table. Then determine if the table represents a linear, quadratic, or exponential function.

44) $\{(-2,-2), (-1,1), (0,4), (1,7), (2,10)\}$

Linear

45) $\{(3,8), (4,24), (5,72), (6,216)\}$

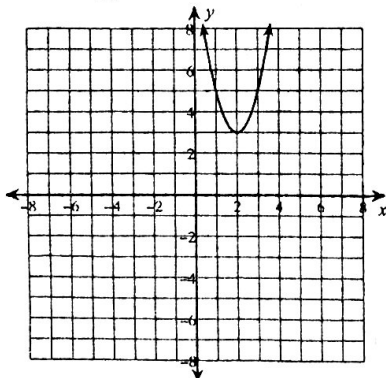
Exponential

8.4 46) Two seagulls dive into the ocean. The given functions represent the height of each seagull above the surface of the ocean as a function of the seagull's horizontal distance from a certain buoy. For each set of functions, determine which bird descends deeper into the ocean.

a. $y = 3(x - 5)^2 - 9$ or $g = \{(-8,0), (-6,-12), (-4,0)\}$

The second bird dives deeper.

b. or $g = 2(x + 4)^2 + 1$

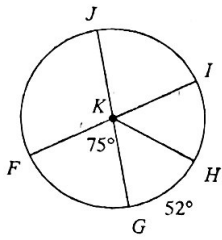


The second bird dives deeper.

Find the measure of the arc or central angle indicated. Assume that lines which appear to be diameters are actual diameters.

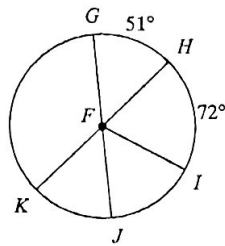
9.1

47) $m\angle JKH$



128°

48) $m\angle KFG$

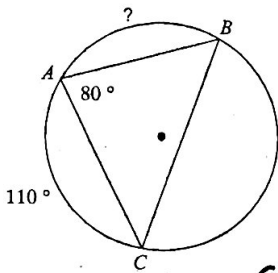


129°

Find the measure of the arc or angle indicated.

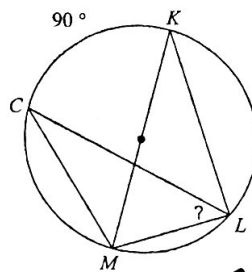
9.1

49)



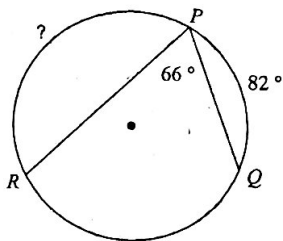
90°

50)



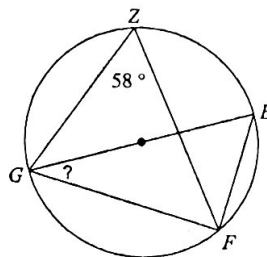
45°

51)



146°

52)

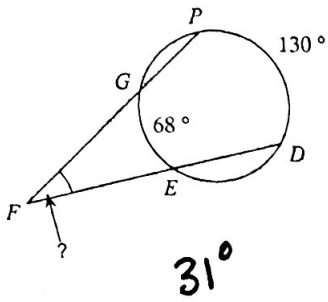


32°

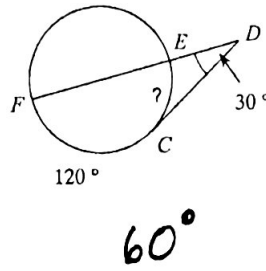
Find the measure of the arc or angle indicated. Assume that lines which appear tangent are tangent.

53)

9.2



54)



Convert each degree measure into radians.

9.3

55) 195° $\frac{13\pi}{12}$

56) 45° $\frac{\pi}{4}$

Convert each radian measure into degrees.

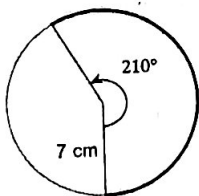
9.3 57) $\frac{3\pi}{4}$ 135°

58) $\frac{19\pi}{18}$ 190°

Find the length of each arc.

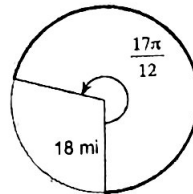
9.3

59)



Exact: $\frac{49\pi}{6}$ cm
Approx: 25.66 cm

60)

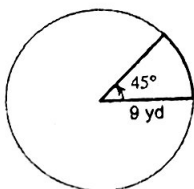


Exact: $\frac{51\pi}{2}$ mi
Approx: 80.11 mi

Find the area of each sector.

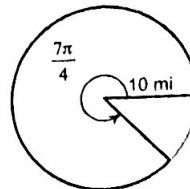
9.3

61)



Exact: $\frac{81\pi}{8}$ yd²
Approx: 31.81 yd²

62)



Exact: $\frac{175\pi}{2}$ mi²
Approx: 274.89 mi²

State if the three numbers can be the measures of the sides of a triangle.

10.1 63) 8, 5, 10

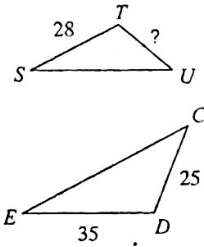
Yes

64) 3, 11, 8

No

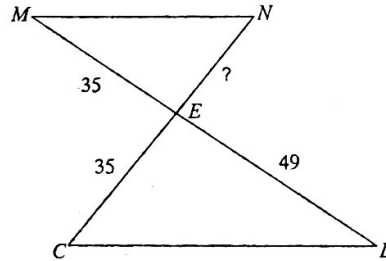
Find the missing length. The triangles in each pair are similar.

10.2 65) $\triangle EDC \sim \triangle STU$



20

66) $\triangle EDC \sim \triangle EMN$



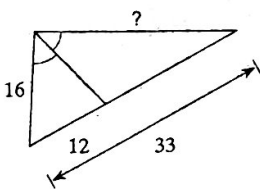
25

67) You are 163cm tall. You cast a shadow that is 100cm long. How tall is the building next to you that casts a 640cm shadow?

1043.2 CM

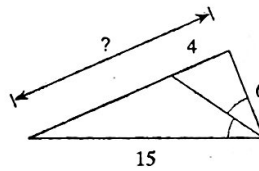
Find the missing length indicated.

10.3 68)



28

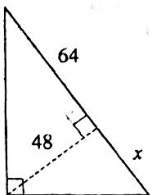
69)



14

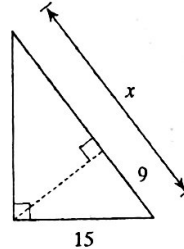
Find the missing length indicated. Leave your answer in simplest radical form.

10.3 70)



$x = 36$

71)



$x = 25$