Math 165 - Reviewing chapters 1 and 2   Name_____
ALSO, review problems from the class' handouts.
Solve the problem.

1) City B is located at 100 miles east and 50 miles north of cityA. City C is located at 75 miles west and 150 miles south of city A. Find the distance between city B and city C. You can choose city A as the origin of the rectangular coordinate system. Write your answer rounded to two decimal places, if necessary.

Use algebra to find the intercepts to two decimal places.

2) $4x^2 - 5y = 68$

Using a graphing utility, to find the intercepts. Approixmate your answers rounded to three decimal places.

3) Find the x- and y-intercepts of $y = x^3 - 3x^2 - 45x - 16$.

Write the standard form of the equation for the circle.

4) Give the equation for a circle.
   Center at (2, -4), radius $\sqrt{2}$

Find the center (h, k) and radius r of the circle. Graph the circle.

5) Find the center, radius, and graph of $x^2 + y^2 - 4x + 8y + 11 = 0$.

Find the general form of the equation for the circle with the given properties.

6) With endpoints of a diameter at (5, 9) and (-1, 3).

Use a graphing utility to approximate the real solutions, if any, of the equation rounded to two decimal places.

7) $-x^4 + 3x^3 + \frac{4}{3}x^2 = \frac{9}{2}x + 2$

Evaluate the function. Express the answer in simplified form.

8) $f(x) = 3x^2 - 5x + 2$. Evaluate $\frac{f(x + h) - f(x)}{h}$, where $h \neq 0$

Determine whether the equation defines y as a function of x.

9) $x^2 - 4y^2 = 1$

Find the domain of the function.

10) $g(x) = \frac{3x}{x^2 - 16}$

11) $f(x) = \sqrt{2 - x}$

Give the domain of the function.

12) $f(x) = \frac{\sqrt{x + 7}}{(x + 5)(x + 7)}$

For the given functions f and g, find the requested function and state its domain.

13) $f(x) = 6x - 2$; $g(x) = 2x - 4$
    Find $(f - g)(x)$.

Solve the problem.

14) Find $\left(\dfrac{f}{g}\right)(-4)$ when $f(x) = 2x - 5$ and $g(x) = 5x^2 + 14x + 2$.

Determine algebraically whether the function is even, odd, or neither.

15) $f(x) = \dfrac{x}{x^2 + 3}$

Find the average rate of change for the function between the given values. Write the equation of the secant line containing $(1, f(1))$ and $(5, f(5))$

16) $f(x) = \sqrt{2x - 1}$; from 1 to 5

Using a graphing utility, determine where the function is increasing and decreasing. Round answers to 3 decimal places. Give any local or absolute extrema points.

17) $f(x) = 4x^3 - 5x^2 - 7x + 3$

Solve the problem.

18) A deep sea diving bell is being lowered at a constant rate. After 8 minutes, the bell is at a depth of 600 feet. After 35 minutes the bell is at a depth of 1900 feet. What is the average rate of lowering per minute? Round to the nearest hundredth if necessary.
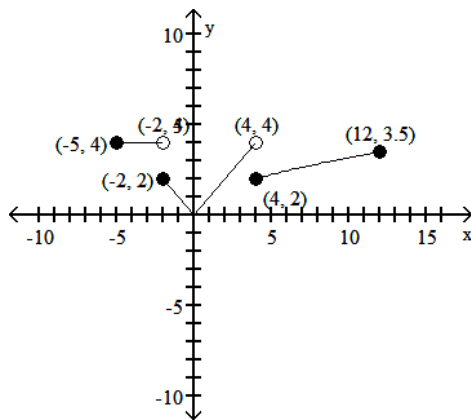
Graph the function.

19) $f(x) = \begin{cases} -x + 2 & \text{if } x < 0 \\ \sqrt{x} + 3 & \text{if } x \geq 0 \end{cases}$

Solve the problem.

20) Evaluate the expression $3f(-2) + 4f(2) + 5f(0)$, given $f(x) = \begin{cases} 2x - 3 & \text{if } x < 0 \\ x + 1 & \text{if } x \geq 0 \end{cases}$.

Write the function for the following graph.

21)

2

Solve the problem.

22) One Internet service provider has the following rate schedule for high-speed Internet service:

Monthly service charge	$18.00
1st 50 hours of use	free
Next 50 hours of use	$0.25/hour
Over 100 hours of use	$1.00/hour

What is the charge for 50 hours of high-speed Internet use in one month?
What is the charge for 75 hours of high-speed Internet use in one month?
What is the charge for 135 hours of high-speed Internet use in one month?

Using transformations, sketch the graph of the function.

23) The graph of $y = f(x)$ is as shown. Sketch the graph of $y = f(x + 2) - 1$
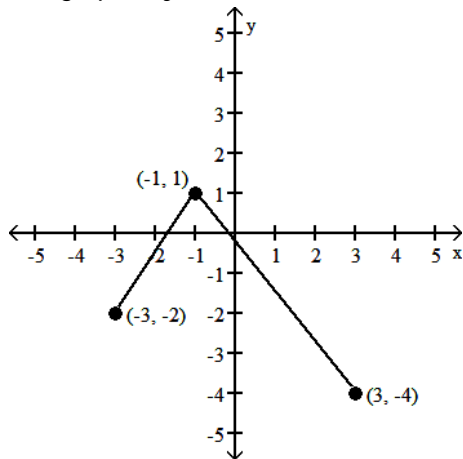
Solve the problem.

24) Let P(x, y) be a point on the graph of $y = x^2 - 6$. Express the distance D from P to the fixed point F((0, 1).

25) A right triangle has one vertex on the graph of $y = x^2$ at (x, y), another at the origin, and the third on the (positive) y-axis. Express the area A of the triangle as a function of x.
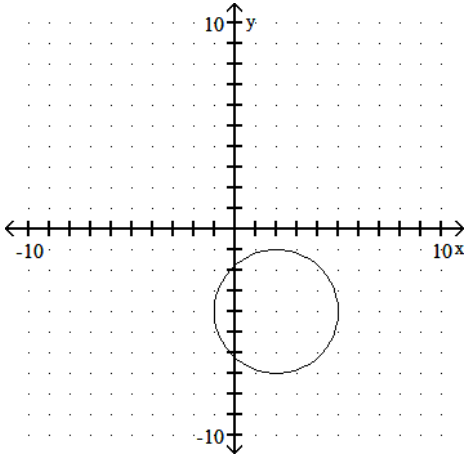
26) A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 14 inches by 29 inches by cutting out equal squares of side x at each corner and then folding up the sides as in the figure. Express the volume V of the box as a function of x.
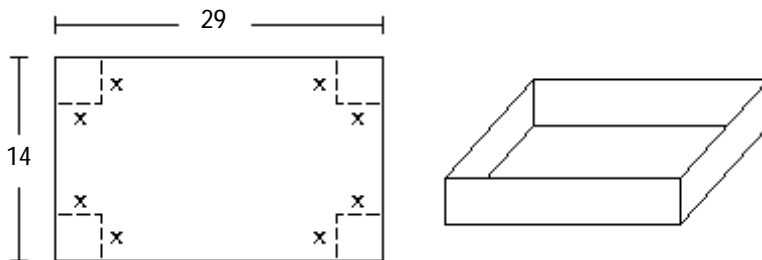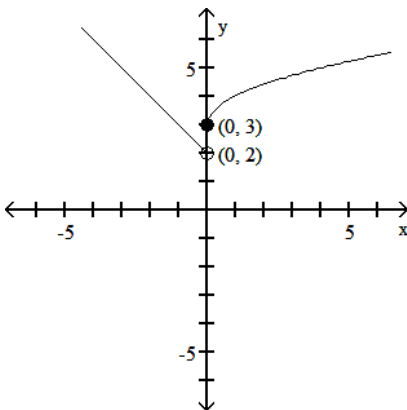
1) 265.75 miles
2) (0, -13.60), (4.12, 0), (-4.12, 0)
3) (-5.144, 0), (-0.366, 0), (8.509, 0), (0, -16)
4) $(x - 2)^2 + (y + 4)^2 = 2$
5) center (2, -4); $r = 3$

6) $x^2 + y^2 - 4x - 12y + 22 = 0$
7) {2.82, 1.61, -0.46, -0.97}
8) 6x + 3h - 5
9) not a function
10) {x | x ≠ -4, 4}
11) {x | x ≤ 2}
12) x ≥ -7, x ≠ -5, x ≠ -7
13) (f - g)(x) = 4x + 2; all real numbers

14) $-\dfrac{1}{2}$

15) odd

16) $\dfrac{1}{2}$

17) the graph is increasing on (-∞, -0.453) and (1.287, ∞); decreasing on (-0.453, 1.287). Local maximum (-0.453, 4.773), local minimum (1.287, -5.764)
18) 48.15 ft per min
19)

20) -4

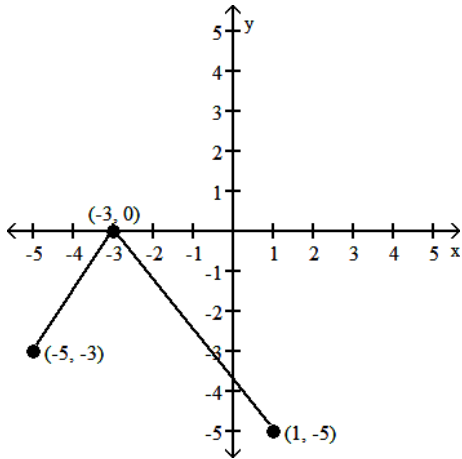21) $f(x) = \begin{cases} 4 & \text{if } -5 \le x < -2 \\ |x| & \text{if } -2 \le x < 4 \\ \sqrt{x} & \text{if } 4 \le x \le 12 \end{cases}$

22) $18.00; $24.25; $65.50

23)

24) $d = sqrt(x^2 + (x^2 - 7)^2)$

25) $A(x) = \dfrac{1}{2}x^3$

26) $V(x) = x(14 - 2x)(29 - 2x)$