Identify the symmetry:  $f(x) = x^2 + x - 4$ 1)

- a. Symmetrical to the x-axis
- b. Symmetrical to the origin

- c. Symmetrical to the y-axis
- d. Not symmetrical

Identify the symmetry:  $f(x) = x^3 - 6x$ 2)

- a. Symmetrical to the x-axis
- b. Symmetrical to the origin

- c. Symmetrical to the y-axis
- d. Not symmetrical

Identify the symmetry:  $f(x) = x^4 + 8$ 3)

- a. Symmetrical to the x-axis
- b. Symmetrical to the origin

- c. Symmetrical to the y-axis
- d. Not symmetrical

True or false:

- 4) A function can be symmetrical to an axis AND the origin at the same time.
- 5) A function can be symmetrical to the x-axis.
- 6) A function can be symmetrical to the y-axis AND have a y-intercept.
- 7) If (3, -2) is a point on a graph that is symmetric with respect to the x-axis, then (-3, -2) is also a point on the graph.

8) Find <u>all</u> intercepts of the function  $f(x) = x^2 + 8x - 20$ . MORE THAN ONE ANSWER IS POSSIBLE!

- a. (0, -20)
- d. (-10, 0)
- b. (10, 0)
- e. (-2, 0)
- c. (2, 0)
- f. (-20, 0)

Find <u>all</u> intercepts of the function  $f(x) = x\sqrt{16 - x^2}$ . MORE THAN ONE ANSWER IS POSSIBLE! 9)

- a. (16, 0)
- d. (-4, 0)
- b. (4, 0)
- e. (0, 0)
- c. (0, 4)
- f. (0, 16)

10) Find the points of intersection of the graphs of the following equations: MORE THAN ONE ANSWER IS POSSIBLE!

$$x - y = 1$$
$$x^2 + y^2 = 5$$

- a. (3, 2)
- d. (0, -1)
- b. (-1, -2)
- e. (2, 1)
- c.  $(\sqrt{5}, 0)$
- f. None of these

11) Find the line that is perpendicular to y - 2x = 4 that passes through the point (2, 7)

- a. y = 2x + 3b. y = -2x + 11c.  $y = -\frac{1}{2}x + 8$ e. y = 2x + 4
- c.  $y = \frac{1}{2}x + 6$
- f. None of these

12) Find the line that is parallel to y - 2x = 4 that passes through the point (2, 7)

- a. y = 2x + 3 d.  $y = -\frac{1}{2}x + 8$
- b. y = -2x + 11
- e. y = 2x + 4
- c.  $y = \frac{1}{2}x + 6$
- f. None of these

## Match:

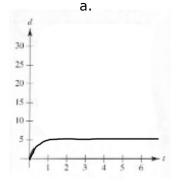
- 13) General Form
- 14) Vertical line
- Horizontal line 15)
- Point-slope form 16)
- Slope-intercept form 17)

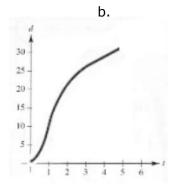
- a. y = mx + b
- b. y b = mx
- d.  $y y_1 = m(x x_1)$
- e. x = a
- f. Ax = By
- q. Ax + By + C = 0
- Find the slope of the line passing through the points (3, -1), (-2, -6)18)
- Find the y-intercept of the line that passes through the points (3, -1), (-2, -6)19)
- 20) True or false: The following points are collinear (2, -2), (-2, 1), (-1, 0)
- 21) True or false: It is possible for two lines with negative slopes to be perpendicular.
- Given  $f(x) = x^2 3$ , find f(8)22)
- Given  $f(x) = x^2 3$ , find  $\frac{f(x + \Delta x) f(x)}{\Delta x}$ 23)
  - a.  $\Delta x$

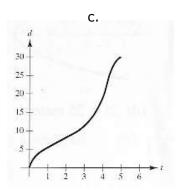
- c.  $2x + \Delta x$
- b.  $\frac{x^2 + \Delta x^2 3}{\Delta x}$
- d. None of these

Water runs into a vase of height 30 centimeters at a constant rate. The vase is full after 5 seconds. Use this information and the shape of the vase shown to answer questions 24 - 28 if d is the depth of the water in centimeters and t is the time in seconds.

- 24) True or false: d is a function of t.
- 25) True or false: t is a function of d.
- Determine the domain of the function. 26)
  - a. (0, 5)
- d. [0, 5]
- b. [0, 5)
- e. None of these
- c. [5, 30)
- 27) Determine the range of the function.
  - a. (0, 30)
- d. [0, 30]
- b. (0, 30)
- e. None of these
- c. [5, 30)
- 28) Which of the following graphs could be a model of the function?



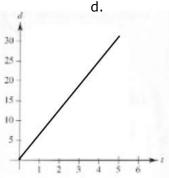




1

d

30 cm



Determine whether the function is even, odd or neither

- 29)  $f(x) = x^2 + 2x + 2$ 
  - a. Even

b. Odd

c. Neither

- 30)  $g(x) = 1 + \sin x$ 
  - a. Even

b. Odd

c. Neither

- 31)  $h(x) = x^4 x^2$ 
  - a. Even

b. Odd

c. Neither

- 32)  $m(x) = x\cos x$ 
  - a. Even

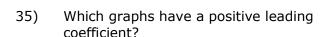
b. Odd

- c. Neither
- An open box is to be made from a rectangular piece of material 9 inches by 12 inches by cutting equal squares from each corner and turning up the sides. Let x be the length of each side of the square cut out of each corner. Write the volume V of the box as a function of x.
  - a)  $V = x^3$

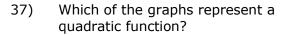
- b) V = 108x
- c) V = x(9 x)(12 x)
- d) V = x(9 2x)(12 2x)
- e) None of these

Use the graphs to the right to answer questions 34 – 39. MORE THAN ONE ANSWER IS POSSIBLE FOR EACH QUESTION. GRAPHS MAY BE USED MORE THAN ONCE.

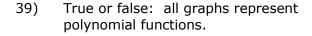
Which of the graphs represent a cubic function?

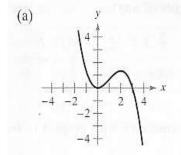


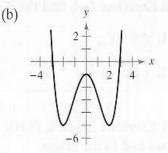
36) What is the minimum degree of (d)?

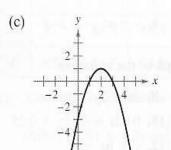


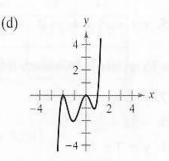
38) How many zeros does (b) have?











- 40) Find the equation of the vertical line that passes through the point (-1, 4)
  - a. x = -1
- b. x = 4
- c. y = 4
- d. y = -
- y = -1 e. None of these