

This packet goes in order of what we've learned so far in chapter 1.  
Use your notes for help if you are having trouble.

Find the x and y-intercept of the graph of the equation (do this algebraically, without graphing).

1)  $y = 2x - 9$

$$0 = 2x - 9$$

$$x = 9/2 \quad (9/2, 0)$$

$$y = 0 - 9$$

$$y = -9 \quad (0, -9)$$

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

$$0 = (x+1)^2$$

$$0 = x+1 \quad (-1, 0)$$

$$x = -1$$

$$y = 1^2$$

$$y = 1 \quad (0, 1)$$

3)  $y = x\sqrt{9-x^2}$

$$0 = x\sqrt{9-x^2}$$

$$x = 0 \quad \sqrt{9-x^2} = 0$$

$$(0, 0) \quad 9-x^2 = 0$$

$$x^2 = 9$$

$$x = \pm 3$$

$$(-3, 0)$$

$$(3, 0)$$

$$y = 0\sqrt{9-0^2}$$

$$= 0$$

$$(0, 0)$$

4)  $y+4 = |x-4|$

$$y+4 = |0-4|$$

$$y+4 = 4$$

$$y = 0$$

$$(0, 0)$$

$$0+4 = |x-4|$$

$$4 = |x-4|$$

$$4 = x-4 \quad 4 = -(x-4)$$

$$x = 8 \quad -4 = x-4$$

$$(8, 0) \quad x = 0$$

$$(0, 0)$$

Find the center and radius of the circle.

5)  $x^2 + y^2 = 9$     c: (0, 0)  
r = 3

6)  $(x-1)^2 + y^2 = 4$     c: (1, 0)  
r = 2

7)  $(x+2)^2 + (y-3)^2 = 16$     c: (-2, 3)  
r = 4

8)  $x^2 + (y+8)^2 = 81$     c: (0, -8)  
r = 9

9) Find the standard form of the equation of the circle for which the endpoints of a diameter are (0,0) and (4,-6).

$$M = \left( \frac{0+4}{2}, \frac{0+(-6)}{2} \right)$$

$$= (2, -3)$$

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

$$(0-2)^2 + (0+3)^2 = r^2$$

$$4 + 9 = r^2$$

$$\sqrt{13} = r$$

$$(x-2)^2 + (y+3)^2 = 13$$

10) Find the standard form of the equation of the circle for which the center is  $(-2, -7)$  and a point on the circle is  $(1, 0)$ .

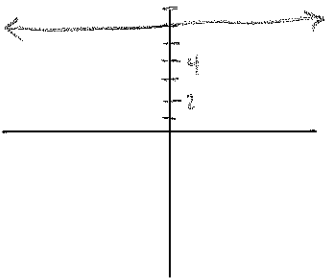
$$\begin{aligned}(x+2)^2 + (y+7)^2 &= r^2 \\ (1+2)^2 + (0+7)^2 &= r^2 \\ 9 + 49 &= r^2 \\ \sqrt{58} &= r\end{aligned}$$

$$(x+2)^2 + (y+7)^2 = 58$$

Find the slope and y-intercept (if possible) of the equation of the line. Sketch the line.

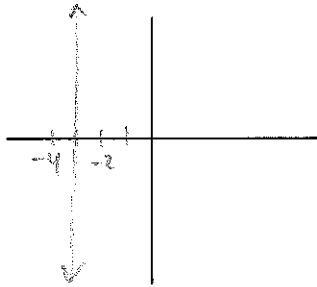
11)  $y = 6$

$m = 0$   
y-int:  $(0, 6)$



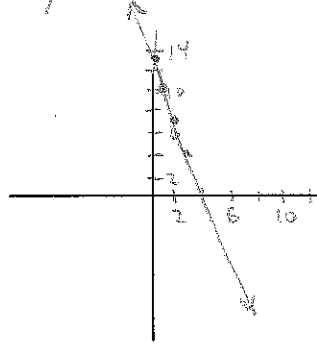
12)  $x = -3$

$m = \text{und}$   
y-int: none



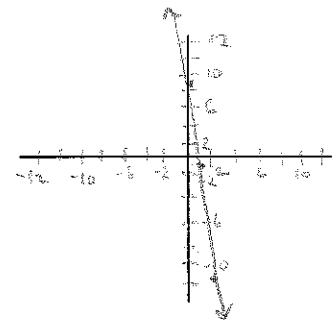
13)  $y = 3x + 13$

$m = 3$   
y-int:  $(0, 13)$



14)  $y = -10x + 9$

$m = -10$   
y-int:  $(0, 9)$



Find the equation of the line (in slope-intercept form) that passes through the points.

15)  $(0, 0)$  and  $(0, 10)$

$$x = 0$$

16)  $(2, 5)$  and  $(-2, -1)$

$$m = \frac{5 - (-1)}{2 - (-2)} = \frac{6}{4} = \frac{3}{2}$$

$$5 = \frac{3}{2}(2) + b$$

$$2 = b$$

$$y = \frac{3}{2}x + 2$$

17)  $(-1, 4)$  and  $(2, 0)$

$$m = \frac{4}{-3}$$

$$0 = -\frac{4}{3}(2) + b$$

$$b = \frac{8}{3}$$

$$y = -\frac{4}{3}x + \frac{8}{3}$$

18)  $(11, -2)$  and  $(6, -1)$

$$m = \frac{-1}{5}$$

$$-1 = -\frac{1}{5}(6) + b$$

$$-1 = -\frac{6}{5} + b$$

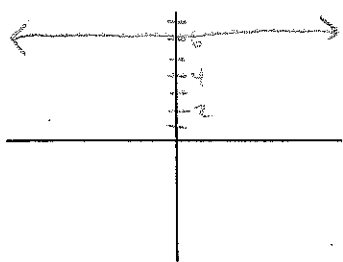
$$\frac{1}{5} = b$$

$$y = -\frac{1}{5}x + \frac{1}{5}$$

Find the equation of the line that passes through the given point and has the specified slope. Sketch the line.

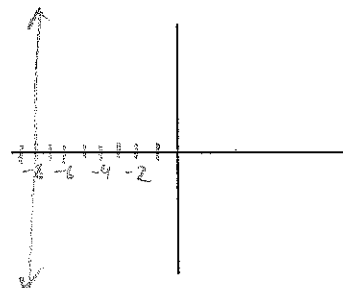
19) Point  $(-2, 6)$  and slope  $= 0$

$$y = 6$$



20) Point  $(-8, 5)$  and slope is undefined

$$x = -8$$



Write an equation of the line through the point that is (a) parallel and (b) perpendicular to the given line.

21) Point  $(3, -2)$  and line  $3x - 4y = 8$

a)  $-4y = 8 - 3x$

$$y = \frac{3}{4}x - 2$$

$$-2 = \frac{3}{4}(3) + b$$

$$-2 = \frac{9}{4} + b$$

$$-\frac{17}{4} = b$$

$$y = \frac{3}{4}x - \frac{17}{4}$$

b)  $-2 = -\frac{4}{3}(3) + b$

$$2 = b$$

$$y = -\frac{4}{3}x + 2$$

22) Point  $(-8, 3)$  and line  $2x + 3y = 5$

a)  $3y = -2x + 5$

$$y = -\frac{2}{3}x + \frac{5}{3}$$

$$3 = -\frac{2}{3}(-8) + b$$

$$-\frac{7}{3} = b$$

$$y = -\frac{2}{3}x - \frac{7}{3}$$

b)  $3 = \frac{3}{2}(-8) + b$

$$3 = -12 + b$$

$$b = 15$$

$$y = \frac{3}{2}x + 15$$

23) Point  $(4, -1)$  and line  $x = 3$

a)  $x = 4$

b)  $y = -1$

24) Point  $(-2, 5)$  and line  $y = -4$

a)

$$y = 5$$

b)

$$x = -2$$

25) You are given the dollar value of a product in the year 2004 and the rate at which the value of the item is expected to change during the next 5 years. Write a linear equation that gives the dollar value  $V$  of the product in terms of the year  $t$ .

(Let  $t = 4$  represent 2004)

2004 Value is \$12,500 and the Rate is \$850 increase per year.

$$(4, 12,500)$$

$$12500 = 850(4) + b$$

$$12500 = 3400 + b$$

$$9100 = b$$

$$V = 850t + 9100$$

Solve for  $y$ , then determine whether the equation is a function.

26)  $16x - y^4 = 0$

$$(y^4)^{1/4} = (16x)^{1/4}$$

$$y = \pm \sqrt[4]{16x}$$

$$y = \pm 2 \sqrt[4]{x}$$

No

27)  $y = \sqrt{1-x}$

yes

28)  $2x - y = 3$

$$y = 2x - 3$$

yes

Evaluate the function as indicated. Simplify your answers.

29)  $f(x) = x^2 + 1$

a)  $f(2) = 5$

b)  $f(-4) = 17$

c)  $f(t^2) = (t^2)^2 + 1 = t^4 + 1$

30)  $g(x) = \begin{cases} 2x+1 & x \leq -1 \\ x^2+2 & x > -1 \end{cases}$

a)  $g(-2) = 2(-2) + 1 = -3$

b)  $g(-1) = 2(-1) + 1 = -1$

c)  $g(0) = 0^2 + 2 = 2$

Find the domain of each function- write your answer in INTERVAL notation!

31)  $f(x) = \sqrt{25 - x^2}$

$$25 - x^2 \geq 0$$

$$x^2 \leq 25$$

$$x \leq 5 \text{ and } x \geq -5$$

$$x \in [-5, 5]$$

32)  $g(x) = \frac{x}{x^2 - x - 6}$

$$x^2 - x - 6 = 0$$

$$(x - 3)(x + 2) = 0$$

$$x = 3, -2$$

$$x \in (-\infty, -2) \cup (-2, 3) \cup (3, \infty)$$

33)  $h(x) = 3x + 4$

$$x \in (-\infty, \infty)$$

34)  $j(t) = |t + 1|$

$$x \in (-\infty, \infty)$$

Use the Vertical Line Test to determine whether y is a function of x (you may use your calculator to graph the function)

35)  $y = (x - 3)^2$

Yes

36)  $y = \frac{-3}{5}x^3 - 2x + 1$

yes

37)  $x - 4 = y^2$

No

Find the zeros of the function.

38)  $f(x) = 3x^2 - 16x + 21$

$$0 = (3x - 7)(x - 3)$$

$$x = \frac{7}{3}, 3$$

$$\left(\frac{7}{3}, 0\right) + (3, 0)$$

39)  $f(x) = 5x^2 + 4x - 1$

$$0 = (5x - 1)(x + 1)$$

$$x = \frac{1}{5}, -1$$

$$\left(\frac{1}{5}, 0\right) + (-1, 0)$$

40)  $g(x) = \frac{8x + 3}{11 - x}$

$$(11 - x)0 = \frac{8x + 3}{11 - x} (11 - x)$$

$$0 = 8x + 3$$

$$x = -\frac{3}{8} \quad \left(-\frac{3}{8}, 0\right)$$

Determine the intervals over which the function is increasing, decreasing or constant.

41)  $f(x) = |x| + |x+1|$

42)  $f(x) = (x^2 - 4)^2$

Decreasing:  $x \in (-\infty, -1)$

Decreasing:  $x \in (-\infty, -2) \cup (0, 2)$

Constant:  $x \in [-1, 0]$

Constant:  $x = -2, 0, \text{ and } 2$

Increasing:  $x \in (0, \infty)$

Increasing:  $x \in (-2, 0) \cup (2, \infty)$

Determine whether the function is even, odd, or neither:

43)  $f(x) = x^5 + 4x - 7$

44)  $g(x) = x^4 - 20x^2$

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

$$= -x^5 - 4x - 7$$

$$\therefore \boxed{\text{Neither}}$$

$$g(-x) = (-x)^4 - 20(-x)^2$$

$$= x^4 - 20x^2$$

$$\therefore \boxed{\text{Even}}$$

45)  $h(x) = 2x\sqrt{x^2 + 3}$

46)  $k(x) = \sqrt[3]{6x^2}$

$$h(-x) = 2(-x)\sqrt{(-x)^2 + 3}$$

$$= -2x\sqrt{x^2 + 3}$$

$$\therefore \boxed{\text{odd}}$$

$$k(-x) = \sqrt[3]{6(-x)^2}$$

$$= \sqrt[3]{6x^2}$$

$$\therefore \boxed{\text{Even}}$$