

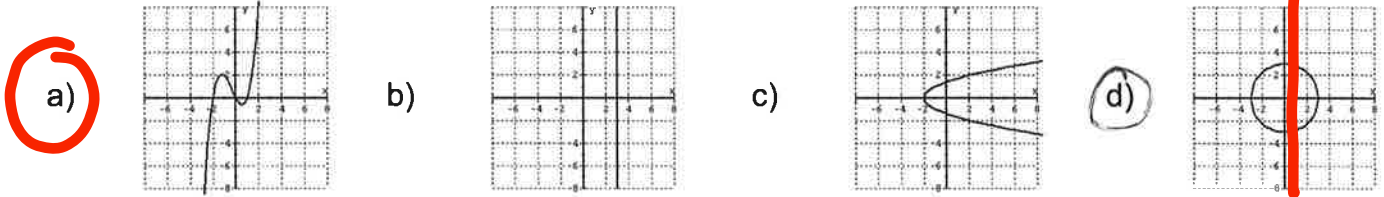
Directions: You must show all work except on multiple choice questions.

MULTIPLE CHOICE Circle the most correct response. (1 point each)

1. Let g be the function $g = \{(2, 5), (3, 4), (4, 6), (5, 4), (6, 7)\}$. Then $g(4) =$

- a) 3 b) 5 **c) 6** d) $g(4)$ is undefined e) $\{2, 3, 4, 5, 6\}$

2. Which of the following is the graph of a function:



3. Let g be the function $g = \{(-2, \underline{4}), (-1, \underline{1}), (0, \underline{0}), (1, \underline{1}), (2, \underline{4})\}$. Then the range of g is:

- a) $\{-2, -1, 0, 1, 2\}$ **b) $\{0, 1, 4\}$** c) $[-2, 2]$ d) $[0, 4]$ **e) none of these**

4. Evaluate $f(-2)$ if $f(x) = -x^2 - x - 1$

- a) 1 b) 5 **c) -3** d) -7

5. Find the center, C , and radius, r , of the circle having equation $(x - 3)^2 + (y + 1)^2 = 4$.

- a) $C(-3, 1), r = 4$ **b) $C(3, -1), r = 2$**
c) $C(3, -1), r = 4$ d) $C(-3, 1), r = 2$

6. Which of the following is the domain of the function $f(x) = \frac{1}{\sqrt{4-x}}$

- a) $(-\infty, 4]$** b) $(-\infty, 4) \cup (4, \infty)$
c) $(-\infty, 4)$ d) $(4, \infty)$

$\frac{41}{71} = 58\%$

Fails VLT

4's

$4x > 0$

$4 > x$
 $x < 4$

-4

7. What kind of symmetry does the function $y = \frac{x^3}{x^2 + 3}$ have?

a) x-axis symmetry

☒ b) y-axis symmetry

☒ c) origin symmetry

d) none

8. Find the x-intercepts of the function $f(x) = x^3 - x^2 - 4x + 4$?

a) 0

☒ b) 1, ± 2

c) -8

d) $\pm 1, 2$

9. The value of an iPhone bought in 2005 depreciates, or decreases, as time passes. Two years after the iPhone was bought, it was worth \$375; 4 years after it was bought, it was worth \$200.

a. Let x represent the number of years after 2005. Write two ordered pairs that can be used to represent this data and use them to write a linear equation that models this data. 5 pts

$$(2, 375), (4, 200) \quad \frac{200 - 375}{4 - 2} = \frac{-175}{2} = -87.5$$

$$\frac{y - 200}{x - 4} = -87.5 \quad y - 200 = -87.5x + 350$$

$$y = -87.5x + 550$$

$-\frac{1}{2}$

b. Use your equation from part (a) to find the value of the iPhone 5 years after it was purchased. 1 pt

$$x = 5 \quad y = -87.5(5) + 550 = \$112.5$$

OK

-1.5

Find the slope of each of the following lines (10 - 11):

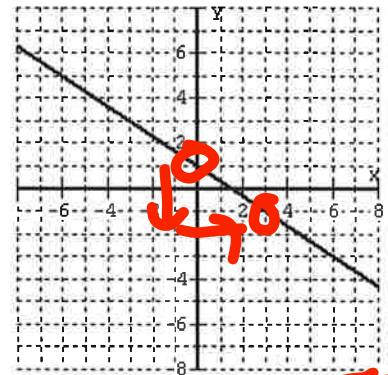
(2 pts)

10. The line $y = -2$

-2
Slope = -2
↓
Horiz. Line
⇒ $m = 0$

11. The line having the graph shown:

-2



Points (0, 1) ~~(10, -1)~~ ??
 $\frac{-1-1}{10-0} = \frac{-2}{10} = -\frac{2}{5}$ Slope = $-\frac{2}{5}$
 $m = -\frac{2}{5}$

12. Without graphing, determine whether the graphs of the following two equations are parallel, perpendicular or neither. Show work.

$$3x + 2y + 6 = 0$$

(3 pts)

$$6x = 4y + 12$$

$$y = -\frac{3}{2}x - \frac{6}{2}, y = -\frac{3}{2}x - 3$$

$$y = \frac{6x}{4} - \frac{12}{4}, y = \frac{3}{2}x - 3 \quad m_1 = -\frac{3}{2}, m_2 = \frac{3}{2}$$

The line are NOT Perpendicular and also

They are NOT Parallel

-4

Find the slope-intercept form of the equation of each line in problems 13 - 16:

13. The line passing through the points $(-2, -7)$ and $(-3, 1)$. (4 pts)

$\therefore \frac{\text{change in } y}{\text{change in } x} = \frac{1 - (-7)}{-3 - (-2)} = \frac{8}{-1} = -8$ $\frac{y+3}{x-1} = -8$ $y = -8x + 11$ ~~$y = -8x + 11$~~

use $y - y_1 = m(x - x_1)$
to get $y = -8x - 23$

14. The line having an x -intercept of 2 and a y -intercept of 4 (3 pts)

$(2, 0)$ $(0, 4)$

$= \frac{y-0}{0-2} = \frac{4}{-2} = -2$ $\frac{y-4}{x-0} = -2$ $y = -2x + 4$

15. The line passing through the point $(-1, 3)$ parallel to the line having equation $2x - 3y = 4$. (4 pts)

$y = \frac{2}{3}x - 4$ $M_1 = \frac{2}{3}$ $M_2 = \frac{2}{3}$

$\frac{y-3}{x+1} = \frac{2}{3}$

$3y - 9 = 2x + 2$

$y = \frac{2}{3}x + 11$

$\frac{11}{3}$

16. The line perpendicular to the y -axis passing through the point $(2, -3)$. (2 pts)

$y \text{ axis} : x = 0$ $\frac{y+3}{x-2} = 0$ $y = -3$

$\frac{11}{3}$

17. Find the x and y -intercepts for the graph of the equation $2x + y = 3$ then graph all of the solutions to the equation. (4 pts)

x -intercept (write as an ordered pair):

$(0, 3)$

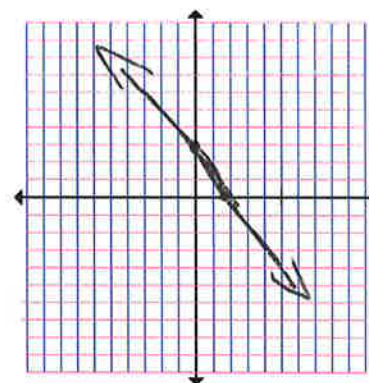
y -intercept (write as an ordered pair):

$(0, 3)$

$$2x + y = 3$$

$$y = -2x + 3$$

-1



18. Find the slope and y -intercept of the line having equation $x - 2y = 3$ and use the slope and y -intercept to graph the solutions to the equation. (4 pts)

Slope: $\frac{1}{2}$

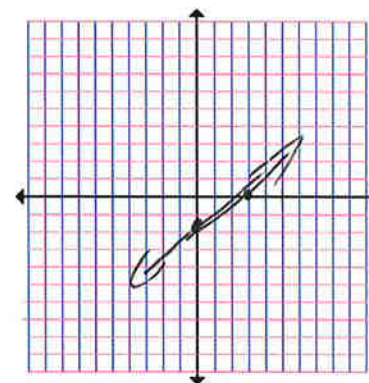
y -intercept: -1.5

$$y = \frac{1}{2}x - 1.5$$

$$y = 0 \quad x = 3$$

$$x = 0 \quad y = -1.5$$

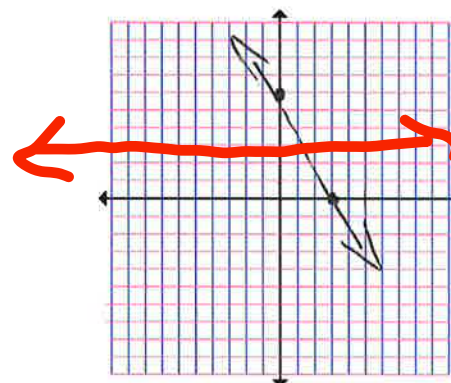
$-\frac{1}{2}$



19. Sketch the graph of all solutions to the equation $-2y + 6 = 0$. (2 pt)

$$2y = 6 \quad y = 3 \rightarrow \text{horizontal.}$$

-2



-3.5

20. Let $f(x) = x^2 + x - 2$. Completely simplify the following:

4 pts

$$2f(a+1) - 3 = 0$$

~~$$f(a+1) - 3^2 = 0$$~~

~~$$a^2 + 2a + 1 - 9 = 0$$~~

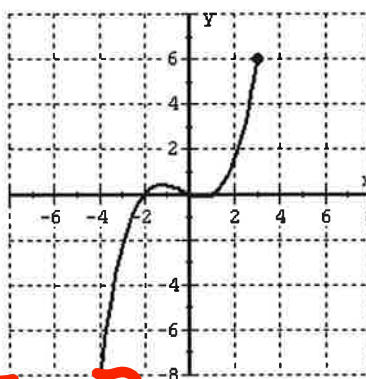
~~$$a^2 + 2a - 8 = 0$$~~

$$2[(a+1)^2 + (a+1) - 2] - 3$$

$$2a^2 + 6a - 3$$

21. The function f is graphed on the right.

6 pts



a) What is the domain of f ?

$$[-4, 3]$$

b) What is the range of f ?

$$[-8, 6]$$

c) Evaluate $f(-2)$

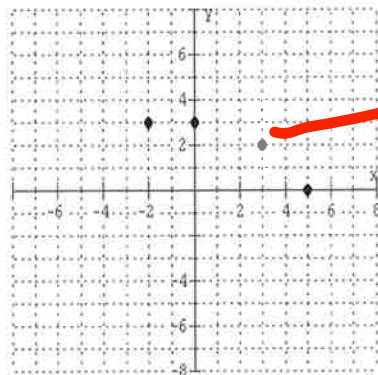
$$= 0$$

d) Find the value(s) of x such that $f(x) = -2$.

$$= -3$$

22. $h(x)$ is represented by the graph shown below.

1 pt



Find $h(3) =$

$$2$$

$$y = 2 \text{ when } x = 3$$

23. The yearly cost of tuition and required fees for attending a public two-year college full-time can be estimated by the linear function $f(x) = 222.5x + 4000$ where x is the number of years after 2005 and $f(x)$ is the total cost (in dollars) according to the U.S. National Center for Education Statistics.

- a. What is the y -intercept of this linear function and what does it mean in the context of this problem? 3 pts

y Intercept is 4000 It means That the amount is ~~constant~~

-2

In 2005, cost of tuition & fees is \$4000.

- b. What is the slope of this linear function and what does it mean in the context of this problem? 3 pts

The slope is 222.5 $\times$ It means

-2

That the ~~amount~~ changes according to year of study,

Cost increases by \$222.50 per year

- c. Use the linear function to predict the yearly cost of tuition and required fees for attending a public two-year college full-time in the year 2015. 2 pts

$$f(x) = 222.5x + 4000 \quad 2015 - 2005 = 10 \text{ years}$$

$$f(x) = (222.5 \times 10) + 4000 = 2225 + 4000 = \$6225$$

-4

24. Use your grapher to help solve the following. Round answers to two decimal places. Include a brief sketch of the graph to justify your response.

4 pts

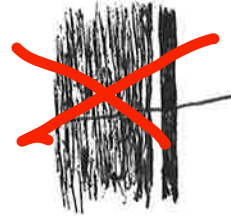
graph

$$x^3 + 11x - 6x^2 - 6 \leq 0 \quad (\text{State answer in interval notation})$$

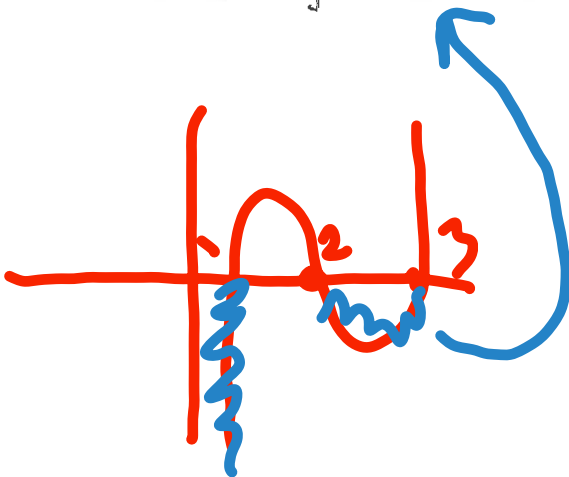
$$(x-1)(x-2)(x-3)$$

$$(x-1)(x-2)(x-3) \leq 0$$

$$[-\infty, 1] \cup [2, 3]$$



-2



25. Find the equation of the circle having endpoints of its diameter at (1, 11) and (-5, 5). 4 pts

$$(x-a)(y-b)=r$$

$$C = \frac{1-5}{2}, \frac{11+5}{2}, = (2, 8)$$

-2

$$(x-2)(y-8)=1$$

$$(x+2)^2(y-8)^2 = x^2 + 2x + 2x + 4 + y^2 - 8y - 8y + 64 = 0$$

$$x^2 + y^2 + 4x + 16y + 67 = 0$$

Need to find radius

$$r = \text{dist btwn } (1, 11) \text{ \& } (-2, 8)$$

-4