

Show all work. NO WORK SHOWN = NO CREDIT

Total Possible Points = 125 Points

1) Solve the given formula for N

$$3N - MP = NS - 4A$$

(8 points)

$$3N - NS = MP - 4A$$

$$N(3 - S) = MP - 4A$$

$$N = \frac{MP - 4A}{3 - S}$$

2) For the linear function $4x - 6y = 20$

SHOW work to find each of the following

a) Write the above function $4x - 6y = 20$ in slope-intercept form

(3 points)

$$-6y = -4x + 20 \implies y = \frac{-4x}{-6} + \frac{20}{-6}$$

$$y = \frac{2}{3}x - \frac{10}{3}$$

b) The slope is $\frac{2}{3}$

(2 points)

c) The y-intercept is $(0, -\frac{10}{3})$

(2 points)

d) The x-intercept is $(5, 0)$

$$4x - 6(0) = 20$$

$$4x = 20$$

$$x = 5$$

(2 points)

3) Complete the following table:

(6 points)

SCIENTIFIC NOTATION	CALCULATOR NOTATION	STANDARD FORM
-2.65×10^{-5}	$-2.65 E -5$	-0.0000265
1.358×10^7	$1.358 E 7$	13,580,000
2.08×10^{-4}	$2.08 E -4$	0.000208

4) Do the following tables represent a Function or Not? EXPLAIN.

(6 points)

FUNCTION OR NOT? EXPLAIN		FUNCTION OR NOT? EXPLAIN	
x	G(x)	x	F(x)
2	8	1	1
<u>3</u>	<u>9</u>	2	8
4	11	3	9
<u>3</u>	<u>11</u>	4	8
2	12	5	7

Not a function
There are two y values
for the same x

Function, b/c
for every x there is
only one y value

5) On the grid below, graph the given lines. Label each graph with the appropriate equation.

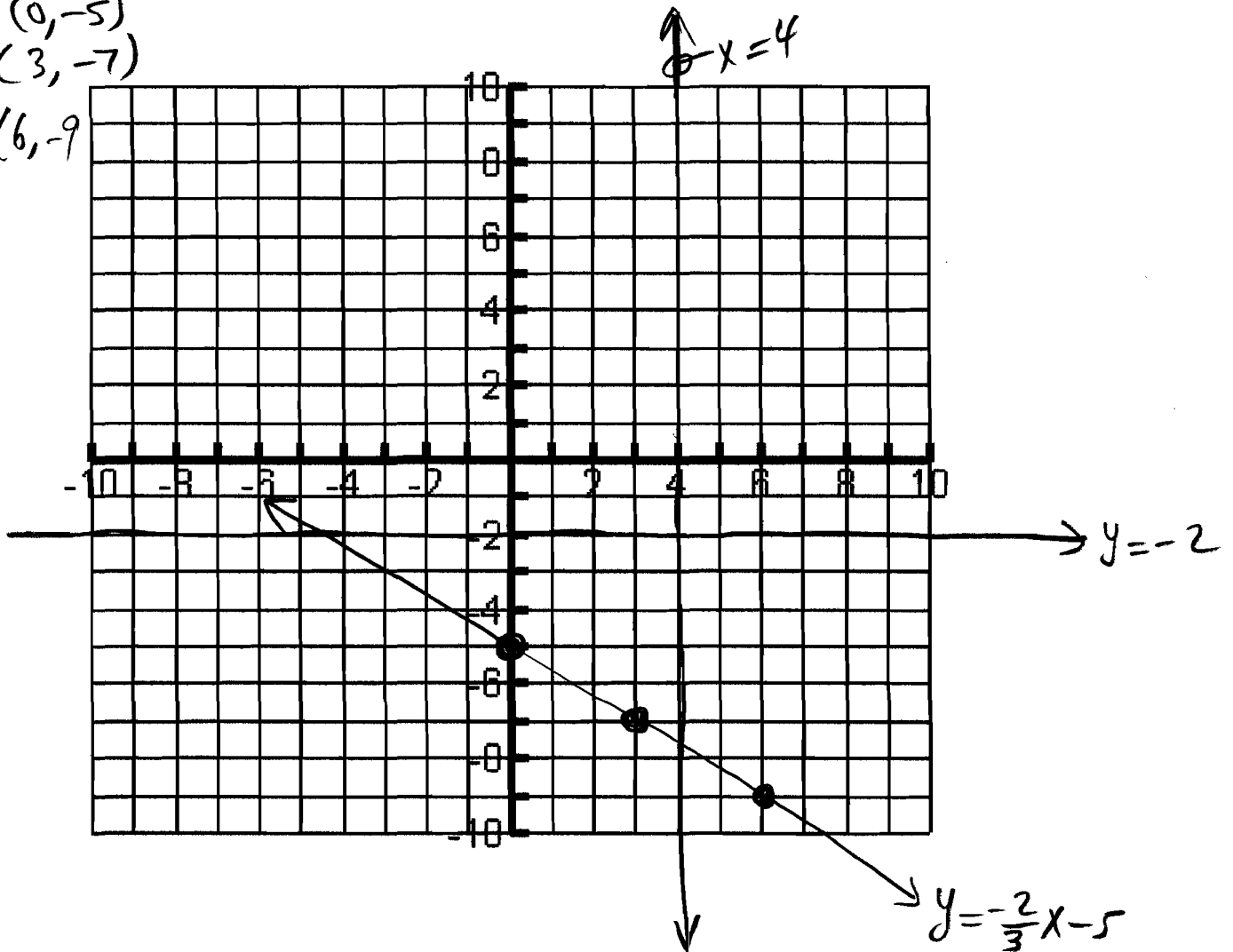
(9 points)

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

b. $y = -2$

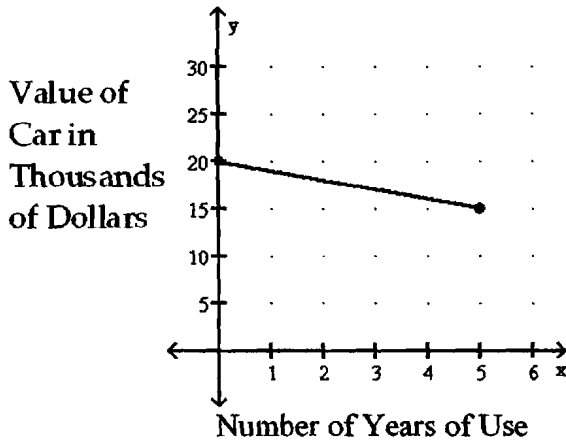
c. $x = 4$

$(0, -5)$
 $(3, -7)$
 $(6, -9)$



6) What is the slope of the line segment shown in the graph? The answer **MUST contain units**.
(Must Show Procedure)

(6 points)



$$(0, 20)$$

$$(5, 15)$$

$$m = \frac{15 - 20}{5 - 0} = \frac{-5}{5} = -1 \text{ thousand/year}$$

Interpret the slope as a rate of change using words within the context of the problem.

Every year the value of the car is reduced by \$1000.

7) The following function gives an approximation for the length of the thigh bone of a woman, as a function of her height, x . $f(x) = 0.432x - 10.44$ (Both variables in inches)

a) Estimate the length of the thigh bone of a 60 inches tall woman. (Round to the nearest tenth of an inch). Answers MUST contain units. (4 points)

$$f(60) = 0.432(60) - 10.44 = 15.5 \text{ inches}$$

b) An anthropologist discovers a thigh bone of a woman. If the bone is 15 inches long, how tall would you estimate the woman to have been? (Round to the nearest tenth of an inch)

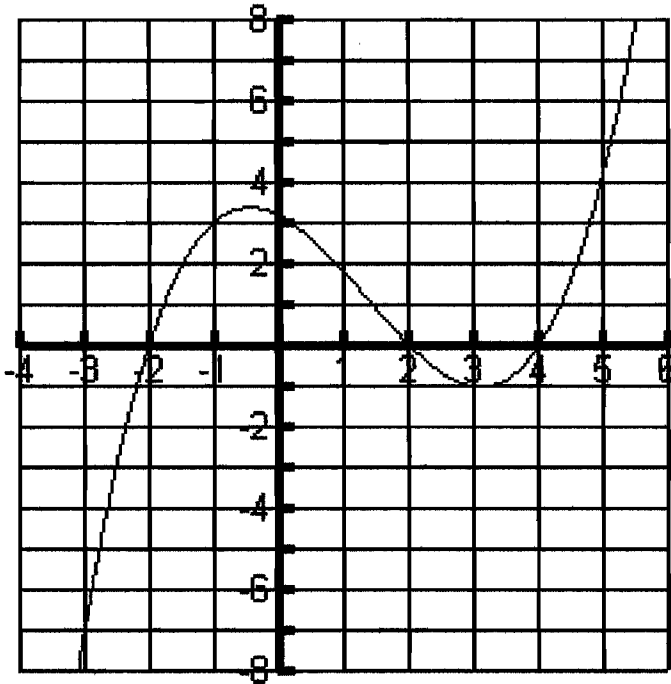
Answers MUST contain units.

(4 points)

$$15 = 0.432x - 10.44 \implies 0.432x = 25.44$$

$$x = 58.9 \text{ inches}$$

8) The graph below is a graph of $f(x)$



- a. Find the approximate value of $f(-1) = \underline{3}$ (2 points)
- b. Approximate the solution to $f(x) \cong -2$. The solution is $\underline{x = -2.3}$ (2 points)
- c. State the domain in
 - Interval notation: $(-\infty, \infty)$ (1 point)
 - Inequality notation: $-\infty < x < \infty$ (1 point)
- d. State the range in
 - Interval notation: $(-\infty, \infty)$ (1 point)
 - Inequality notation: $-\infty < y < \infty$ (1 point)
- e. What are the x-intercepts? $(-2, 0)$ $(2, 0)$ $(4, 0)$ (2 points)
- f. What is the y-intercept? $(0, 3)$ (2 points)

9) Let $f(x) = -2x^2 + 3x - 2$ and $g(x) = -5x + 9$ (Must Show Procedure) (2 points each)

a. Find $f(-1) = -7$	b. Find $g(-5) = 34$
c. Find x when $g(x) = 14$ $14 = -5x + 9$ $x = -1$	d. Find the x -intercept of $g(x)$ $0 = -5x + 9$ $x = \frac{9}{5}$
e. Find $g(a+1)$ $g(a+1) =$ $= -5(a+1) + 9$ $= -5a - 5 + 9$ $= -5a + 4$	f. Find $g(a) - 1$ $-5a + 9 - 1$ $= -5a + 8$

10) Jury Awards in Medical Malpractice. The average jury awards in medical malpractice were 1.3 million dollars in 1995, and 4.0 million dollars in 1999.

a) Assuming they follow a linear pattern, find an equation for the average amount of jury award $A(t)$ in millions of dollars as a function of t , number of years since 1995. (7 points)

$(0, 1.3)$ $m = 0.675$
 $(4, 4.0)$ $y = A(t) = 0.675t + 1.3$

b) What is the y -intercept? What is the meaning within the context of the problem? (3 points)

$(0, 1.3)$

c) Based on the model in part (a), find the average jury award in the year 2000. (3 points)

$0.675(5) + 1.3 = 4.675$ million Dollars

11) Write an equation of the line that passes through (2, -3) and is parallel to the line $5X + 6Y = 12$. Give final answer in the slope intercept form. (Must Show Procedure)

(10 points)

$$6y = -5x + 12$$

$$y = -\frac{5}{6}x + 2$$

$$y - (-3) = -\frac{5}{6}(x - 2)$$

$$y = -\frac{5}{6}x + \frac{10}{6} - 3 = -\frac{5}{6}x + \frac{10 - 18}{6}$$

$$= -\frac{5}{6}x - \frac{8}{6} = -\frac{5}{6}x - \frac{4}{3}$$

12) Simplify each of the following. Write answers with positive exponents. Do not use decimals. (Assume no variables are equal to zero.)

(Must Show Procedure)

(12 points)

a) $\left(\frac{3y^7z^{-3}}{y^{-10}z^4}\right)^{-2}$

$$(3y^{17}z^{-7})^{-2}$$

$$= 3^{-2}y^{-34}z^{14}$$

$$= \frac{z^{14}}{9y^{34}}$$

b) $(-5a^{-1}b) \cdot (-2)^{-3}$

$$= \frac{-5b}{a} \cdot \frac{1}{(-8)}$$

$$= \frac{-5b}{-8a} = \frac{5b}{8a}$$

13) Solve the following equation $\left(\frac{-3x}{5} = \frac{5}{2}x - 2\right)$

(Must Show Procedure)

(8 points)

Multiply by 10

$$10\left(\frac{-3x}{5}\right) = 10\left(\frac{5}{2}x\right) - 10(2)$$

$$-6x = 25x - 20$$

$$-31x = -20$$

$$x = \frac{20}{31}$$

14) If the slope of a line is $m = \frac{-2}{5}$, then, the slope of a perpendicular line is $\frac{5}{2}$

(2 points)

15) The slope of a horizontal line is 0

(2 points)

16) The slope of a vertical line is $undefined$

(2 points)