Warm Up May 6, 2019

1.) Two functions are shown below:

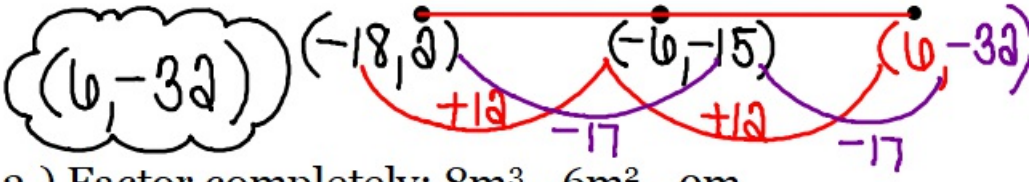
$f(x) = 1/3 \cdot (3)^x$ (Y_1)

$g(x) = 4x + 10$ (Y_2)

X=3

What is the largest integer value x such that $f(x) \leq g(x)$?

2.) The midpoint of line segment XZ at (-6, -15). The endpoint X is located at (-18, 2). What are the coordinates of Z?



3.) Factor completely: $\frac{8m^3}{m} - \frac{6m^2}{m} - \frac{9m}{m}$

$m(8m^2 - 6m - 9)$

$a = 8 \quad b = -6 \quad c = -9$

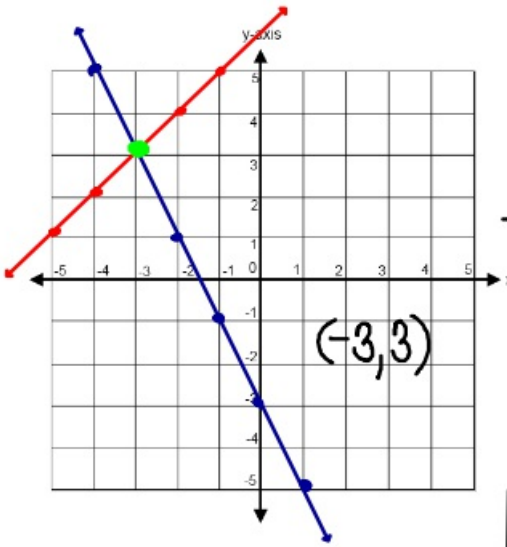
$(8m^2 + 6m)(-12m - 9)$

$\frac{8m}{2m} \quad \frac{6m}{2m} \quad \frac{-12m}{-3} \quad \frac{-9}{-3}$

$2m(4m+3) - 3(4m+3)$

$m(2m-3)(4m+3)$

ac = -72	
1	-72
2	-36
3	-24
6	-12
8	-9



$$2x+y=-3$$
$$-2x \quad -2x$$
$$y=-2x-3$$

#2 $2x+9y=27$
$x-3y=-24$

$$x-3y=-24$$
$$+3y \quad +3y$$
$$x=3y-24$$

$$2(3y-24)+9y=27$$
$$6y-48+9y=27$$
$$15y-48=27$$
$$+48 \quad +48$$
$$\frac{15y}{15}=\frac{75}{15}$$
$$y=5$$

$(-9,5)$

$$x=3(15)-24$$
$$x=-9$$

#3 $4x+2y=6$
$-2x+2y=18$

$$\frac{6x}{6}=\frac{-12}{6}$$
$$x=-2$$

$$4(-2)+2y=6$$
$$-8+2y=6$$
$$2y=14$$
$$y=7$$

$(-2,7)$

Example The table below shows the number of students per computer in United States public schools for certain school years from 1990 to 2000.

Year	0	2	4	6	8	10
Students per Computer	22	18	14	10	6.1	5.4

A. What is the equation for the line of best fit?

$y = -1.8x + 21.3$

B. What is the meaning of the slope?

The number of students per computer decreases by 1.8 every year.

C. What is the meaning of the y-intercept?
(value of y when x = 0 *in context*)

It was predicted that there would be 21.3 students per computer in 1990.

The equation $y = 37x - 153$ models the relationship where x is the number of carbon atoms, and y is the boiling point.

a. What is the boiling point for a hydrocarbon with a 10 carbon Atoms?

$y = 37(10) - 153$

$y = 217°$

b. If the boiling point is 587, how many carbon atoms are there?

$587 = 37x - 153$

$+153 \quad +153$

$\frac{740}{37} = \frac{37x}{37}$

$x = 20$ carbon atoms

Five students in Mrs. Straub's Algebra class reported the number of hours that they studied for a test. The number of hours and their test scores are in the table below.

Hours of Study	Test Score
2	85
3	81
4	88
5	91
6	98

a. Find the equation of the line of best fit $y = 3.6x + 74.2$

b. What is the meaning of the y-intercept? If you study 0 hours, your predicted score is 74.2.

C. What is the predicted score of a student who studied 1.5 hours?

$y = 3.6(1.5) + 74.2$

$y = 79.6$

D. If a student earned a 77 on the test, based on the line of best fit, how many hours did they study?

$77 = 3.6x + 74.2$

$-74.2 \quad -74.2$

$\frac{2.8}{3.6} = \frac{3.6x}{3.6}$

$x = .77$ hours

4. The Jones' average phone bills in the years 1999 to 2006 are displayed in the table below.

	0	1	2	3	4	5	6	7
Year X	1999	2000	2001	2002	2003	2004	2005	2006
Average Monthly Bill Y	$65	$65	$68	$72	$70	$73	$78	$82

a. What is the line of best fit? $y = 2.35x + 63.42$

b. According to the line of best fit for the data, *approximately* how much per month would the Jones' pay in 2008? $84.57

$2008 - 1999$

$x = 9$

$y = 2.35(9) + 63.42$

C. What is the meaning of the slope?

The average monthly bill increases by $2.35 every year.

5. The table shows the average hourly earnings in the US production workers for selected years.

	0	5	10	15	20	25	30	35	39
Year X	~~1960~~	~~1965~~	~~1970~~	~~1975~~	~~1980~~	~~1985~~	~~1990~~	~~1995~~	~~1999~~
Earnings y	2.09	2.46	3.23	4.53	6.66	8.57	10.01	11.43	13.24

a. Find the regression equation(line of best fit): $y = 0.3x + .92$

b. What is the slope? $m = 0.3$

c. What is the meaning of the slope? The average hourly earnings increases by $0.30 every year.

d. What is the y-intercept? $b = .92$

e. What is the meaning of the y-intercept? In 1960, the predicted average hourly earnings is $0.92.

f. According to the regression equation what will be the average hourly earnings in the year 2010? $15.92

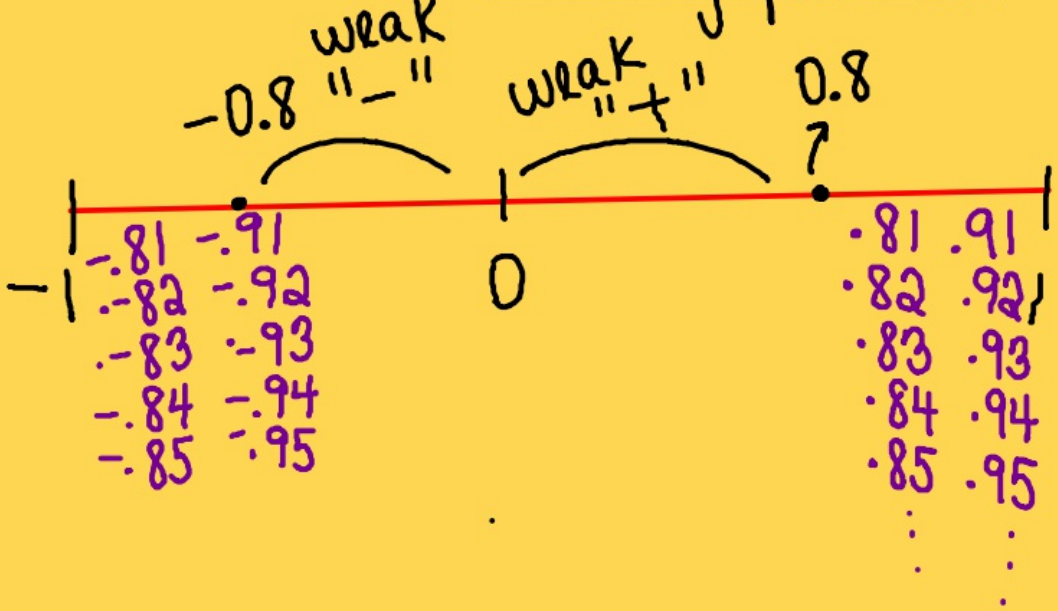
$2010 - 1960$

$X = 50$

$y = 0.3(50) + .92$

g. Identify the correlation coefficient. $r = .99$

h. Describe the correlation. strong positive



$$\frac{[1.85-7.4633+72.893-20.4032](38)}{4.184}$$

$$\frac{46.88\,(38)}{4.184}=\frac{1781.37}{4.184}=425.78\ \text{cal.}$$

#2 $\frac{38\ \text{min}}{425.78\ \text{cal}}=\frac{60\ \text{min}}{X\ \text{cal}}$

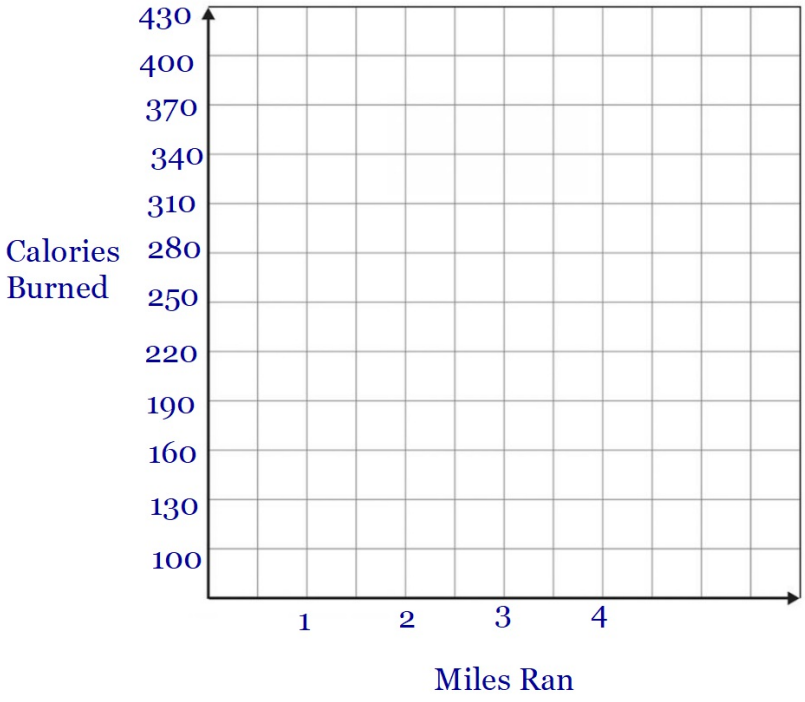
$$\frac{38X}{38}=\frac{25546.8}{38}$$

$$X=672.28$$

#3 $\frac{46.88\,(t)}{4.184}=617$

$$\frac{46.88t}{46.88}=\frac{2581.53}{46.88}$$

$$t=55.07\ \text{min.}$$


Calories Burned
430
400
370
340
310
280
250
220
190
160
130
100
1
2
3
4
Miles Ran