Student: _____ Date: _____	**Instructor:** Joe Betters **Course:** Pre-Calculus Pre AP (Master **Assignment:** 3.1-3.2 Classwork Course)

1. Suppose that f(x) = 3x − 6 and g(x) = − 4x + 1.

(a) Solve f(x) = 0.   (b) Solve f(x) > 0.

(c) Solve f(x) = g(x).   (d) Solve f(x) ≤ g(x).

(e) Graph y = f(x) and y = g(x) and label the point that represents the solution to the equation f(x) = g(x).

(a) For what value of x does f(x) = 0?

x = _____   (Type an integer or a simplified fraction.)

(b) For which values of x is f(x) > 0?

For every x in the interval _____ , f(x) > 0.
(Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)
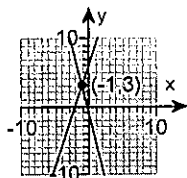
(c) For what value of x does f(x) = g(x)?

x = _____

(d) For which values of x is f(x) ≤ g(x)?
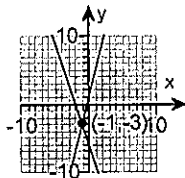
For every x in the interval _____ , f(x) ≤ g(x).
(Type your answer in interval notation.)

(e) Which graph represents the solution to the equation f(x) = g(x)?

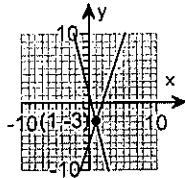○ **A.**   ○ **B.**   ○ **C.**   ○ **D.**
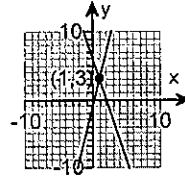
ID: 3.1.29

2. Suppose that the quantity supplied S and quantity demanded D of T-shirts at a concert are given by the following functions where p is the price.

$$S(p) = -350 + 40p$$
$$D(p) = 1150 - 60p$$

Answer parts (a) through (c).

(a) Find the equilibrium price for the T-shirts at this concert.

The equilibrium price is $_____ (Round to the nearest dollar as needed.)

What is the equilibrium quantity?

The equilibrium quantity is _____ T-shirts.
(Type a whole number.)

(b) Determine the prices for which quantity demanded is greater than quantity supplied.

For the price $_____ (1) _____ p (2) _____ $_____ , the quantity demanded is greater than quantity supplied.

(c) What will eventually happen to the price of the T-shirts if the quantity demanded is greater than the quantity supplied?

◯ A. The price will increase.
◯ B. The price will decrease.

(1) ◯ <   (2) ◯ <
    ◯ ≤   ◯ ≤

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3. A truck rental company rents a moving truck for one day by charging $33 plus $0.12 per mile. Write a linear equation that relates the cost C, in dollars, of renting the truck to the number x of miles driven. What is the cost of renting the truck if the truck is driven 129 miles? 458 miles?

Type the linear equation that relates the cost C, in dollars, of renting the truck to the number of x miles driven.

C = _____
(Use integers or decimals for any numbers in the expression. Do not include the $ symbol in your answer.)

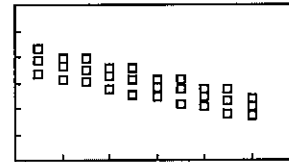What is the cost of renting the truck if the truck is driven 129 miles?

C = $_____

What is the cost of renting the truck if the truck is driven 458 miles?

C = $_____

ID: 3.1.49

4. Examine the scatter diagram and determine whether the type of relation, if any, that may exist is linear or nonlinear.

Choose the correct answer below.

○   There is a linear relationship.

○   There is a nonlinear relationship.

○   There is no relation.

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5. For the data given below, answer parts **(a)** through **(d)**.

x	− 2	− 1	0	1	2
y	− 4	0	1	3	5

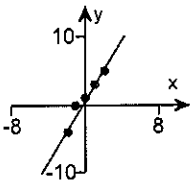**(a)** Find the equation of the line containing the first and the last data points.

y = _____

(Type your answer in slope-intercept form. Use integers or fractions for any numbers in the expression.)
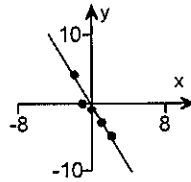
(b) Draw a scatter diagram and the line found in part **(a)** on the same axes.
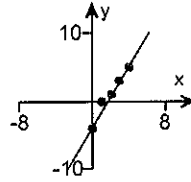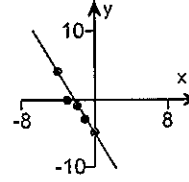
Choose the correct graph below.

○ **A.**   ○ **B.**   ○ **C.**   ○ **D.**

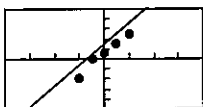**(c)** Use a graphing utility to find the line of best fit.

Which of the following is the equation of the line of best fit?

○ **A.** $y = -2.1x - 1$

○ **B.** $y = 2.1x + 1$

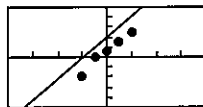○ **C.** $y = -2.1x + 1$

○ **D.** $y = 2.1x - 1$

(d) Use a graphing utility to draw the scatter diagram and graph the line of best fit on it.

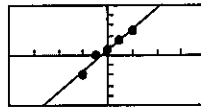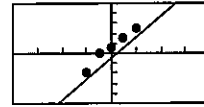Choose the correct graph below. The viewing window for each graph is $[-8,8,2]$ by $[-10,10,2]$.

○ **A.**   ○ **B.**   ○ **C.**   ○ **D.**

ID: 3.2.13

6. A professor wanted to find a linear model that relates the number of hours a student plays video games each week, h, to the cumulative grade-point average, G, of the student. He obtained a random sample of 10 full-time students at his college and asked each student to disclose the number of hours spent playing video games and the student's cumulative grade-point average.

Complete parts (a) through (f) below.

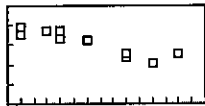| Hours of Video Games per Week, h	Grade-point Average, G
1	3.89
1	3.55
3	3.74
4	3.32
4	3.69
6	3.28
9	2.31
9	2.54
11	2.03
13	2.51

(a) Explain why the number of hours spent playing video games is the independent variable and cumulative grade-point average is the dependent variable. Choose the correct answer below.

○ **A.** The number of hours is directly related to the cumulative grade-point average.

○ **B.** Cumulative grade-point average is being used to predict the number of hours.

○ **C.** The number of hours is being used to predict cumulative grade-point average.

○ **D.** The number of hours and the cumulative grade-point average are unrelated.

(b) Use a graphing utility to draw a scatter diagram. Choose the correct scatter diagram below.
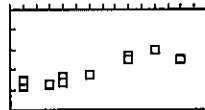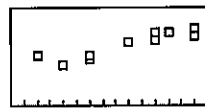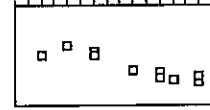
○ **A.**   ○ **B.**   ○ **C.**   ○ **D.**

[0,15,1] by [0,5,1]   [0,15,1] by [-5,0,1]   [-15,0,1] by [0,5,1]   [-15,0,1] by [-5,0,1]

(c) Use a graphing utility to find the line of best fit that models the relation between the number of hours of video game playing each week and grade-point average. Express the model using function notation.

G(h) = _____

(Type an expression using h as the variable. Round to four decimal places as needed.)

(d) Interpret the slope. Choose the correct answer below.

○ **A.** If the number of hours playing video games in a week increases by 1 hour, the cumulative grade-point average decreases 0.15, on average.

○ **B.** If the number of hours playing video games in a week increases by 1 hour, the cumulative grade-point average decreases 4.0, on average.

○ **C.** If the number of hours playing video games in a week increases by 1 hour, the cumulative grade-point average increases 0.15, on average.

(e) Predict the grade-point average of a student who plays video games for 6 hours each week.

_____

(Round to two decimal places as needed.)

(f) How many hours of video game playing does a student play whose grade-point average is 2.40?

Approximately _____ hrs.
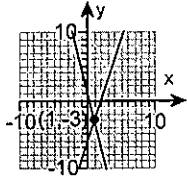
(Round to one decimal place as needed.)

ID: 3.2.19

1. 2

$(2,\infty)$

1

$(-\infty,1]$

C.

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2. 15

250

0

(1) $\leq$

(2) $<$
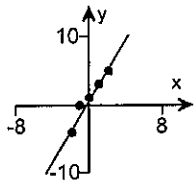
15

A. The price will increase.

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3. 0.12x + 33

48.48

87.96

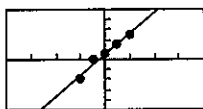4. There is a linear relationship.

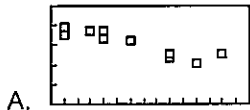
5. $\frac{9}{4}x + \frac{1}{2}$

A.

B. y = 2.1x + 1

C.

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6. C. The number of hours is being used to predict cumulative grade-point average.

A. $[0,15,1]$ by $[0,5,1]$

$-0.1464h + 3.9788$

A.
If the number of hours playing video games in a week increases by 1 hour, the cumulative grade-point average decreases 0.15, on average.

3.10

10.8

3.1-3.2 classwork

① $f(x) = 3x - 6$ and $g(x) = -4x + 1$

a) $f(x) = 0$ $3x - 6 = 0$ $\boxed{x = 2}$

b) $f(x) > 0$ $3x - 6 > 0$ $x > 2$
   $\boxed{(2, \infty)}$

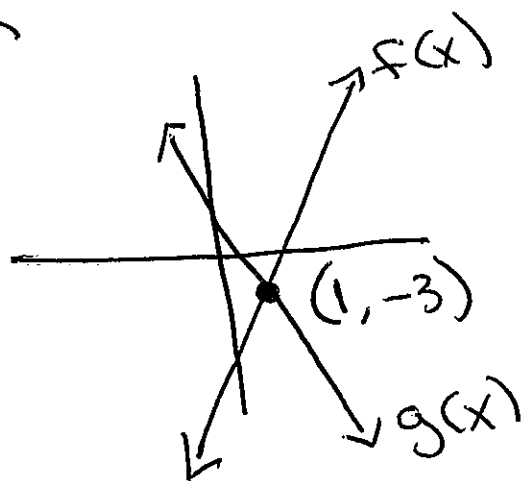c) $f(x) = g(x)$ $3x - 6 = -4x + 1$
   $7x = 7$
   $\boxed{x = 1}$

d) $f(x) \leq g(x)$ $3x - 6 \leq -4x + 1$
   $7x \leq 7$ $\boxed{(-\infty, 1]}$
   $x \leq 1$

e) graph

$f(x)$

$(1, -3)$

$g(x)$

$\boxed{C}$

3.1-3.2 classwork continued

② $S(p) = -350 + 40p$

$D(p) = 1150 - 60p$

a) equilibrium

$$-350 + 40p = 1150 - 60p$$

$$\boxed{p = \$15} \text{ price}$$

$$S(15) = -350 + 40(15) = \boxed{250}$$

Quantity

b) $1150 - 60p > -350 + 40p$

~~$p < 15$~~

$$\boxed{0 \le p < 15}$$

c) $\boxed{\text{price will increase}}$ if quantity demanded is greater than quantity supplied

3.1-3.2 classwork continued

③ $C(x) = .12x + 33$

$C(129) = .12(129) + 33 = \boxed{\$48.48}$

$C(458) = .12(458) + 33 = \boxed{\$87.96}$

④
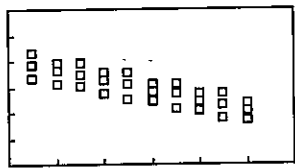
$\boxed{\text{Linear Relationship}}$

As values increase, result decreases

⑤

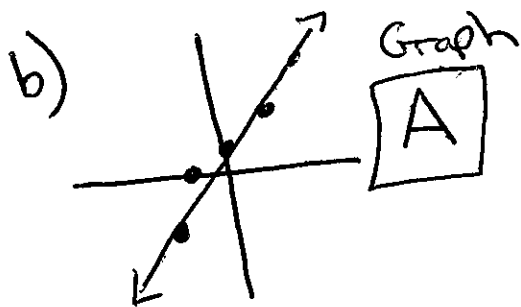| x	-2	-1	0	1	2
y	-4	0	1	3	5

b)

Graph $\boxed{A}$

a) $(-2, -4), (2, 5)$

$m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{5 - (-4)}{2 - (-2)} = \dfrac{9}{4}$

$y = mx + b$

$-4 = \dfrac{9}{4}(-2) + b$
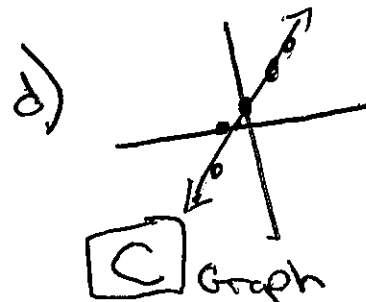
$\boxed{y = \dfrac{9}{4}x + \dfrac{1}{2}}$

$b = \frac{1}{2}$

c) calculator $\boxed{y = 2.1x + 1}$

$\boxed{B}$ best fit

d)

$\boxed{C}$ Graph

3.1-3.2 classwork continued

(6)

Hours of Video Games per Week, h	Grade-point Average, G
1	3.89
1	3.55
3	3.74
4	3.32
4	3.69
6	3.28
9	2.31
9	2.54
11	2.03
13	2.51

a) [C] number of hours used to predict GPA

b) Graph [A]

c) *calculator

$$y = -.1464h + 3.9788$$

d) [A] If the number of hours increases by 1 hour, GPA decreases by .15 on average

e) 6 hours

$$y = -.1464(6) + 3.9788 = \boxed{3.10} \text{ GPA}$$

f) GPA = 2.4

$$2.4 = -.1464h + 3.9788 \quad \boxed{10.8} \text{ hours}$$