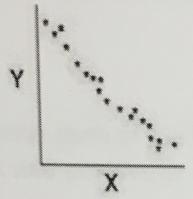
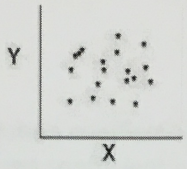
Unit 4 Review

Name: KEY Date:

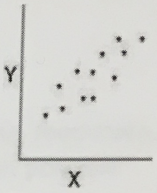
Directions: Examine each scatterplot. Identify each as showing a positive correlation, a negative correlation, or no correlation.

1. 

NEGATIVE CORRELATION

2. 

NO CORRELATION

3. 

POSITIVE CORRELATION

Directions: Each set of bivariate data has a causal relationship. Determine the explanatory (independent) and response (dependent) variables for each set.

4. number of hours spend reading and page number on which you are reading.

Explanatory (independent) variable: HOURS SPENT READING

Response (dependent) variable: PAGE NUMBER YOU'RE ON

5. calories burned and number of minutes exercising.

Explanatory (independent) variable: NUMBER OF MINUTES EXERCISING

Response (dependent) variable: CALORIES BURNED

6. amount paid as income tax and amount of a paycheck

Explanatory (independent) variable: AMOUNT OF A PAYCHECK

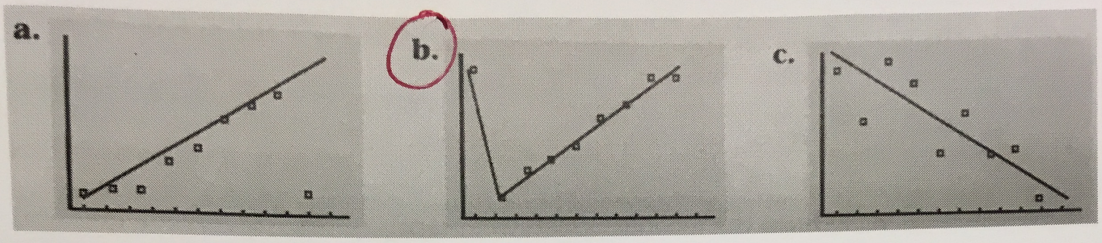
Response (dependent) variable: AMOUNT PAID AS INCOME TAX

7. pounds of hamburger use to make a meatloaf and number of people that can be fed from the meatloaf

Explanatory (independent) variable: POUNDS OF HAMBURGER COOKED

Response (dependent) variable: NUMBER OF PEOPLE THAT CAN BE FED.

8. Which of the scatterplots below does NOT show a line of best fit?



9. Describe each of the following correlation coefficients using the terms strong, moderate, or weak and positive or negative. If a given coefficient is not possible, state "not possible".

a) $r = 0.17$ WEAK POSITIVE

b) $r = -0.62$ MODERATE NEGATIVE

c) $r = -0.88$ STRONG NEGATIVE

d) $r = 1.02$ NOT POSSIBLE

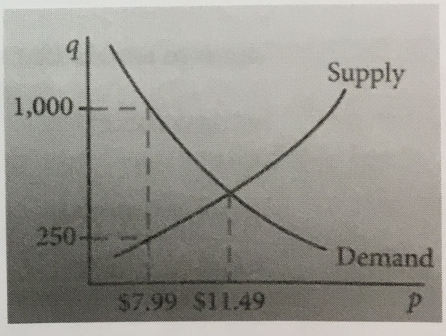
e) $r = 0.33$ WEAK/MODERATE POSITIVE

f) $r = -3.78$ NOT POSSIBLE

g) $r = -0.25$ WEAK NEGATIVE

h) $r = 0.91$ STRONG POSITIVE

10. The graph below shows supply and demand curves for the newest game controller for a video game system.



a) What is the equilibrium price? $11.49

b) Describe what happens at this equilibrium price.

SUPPLY = DEMAND

c) What will happen if the price is set at $7.99?

THERE WILL NOT BE ENOUGH SUPPLY TO MEET THE DEMAND (SHORTAGE)

d) How many game controllers are supplied at a price of $7.99?

250

e) What will happen if the price is set at $12.99?

THERE WILL NOT BE ENOUGH DEMAND TO SELL THE SUPPLY

11. The demand function for a certain product is $q = -300p + 10{,}000$. The fixed expenses are \$500,000 and the variable expenses are \$2 per item produced.

a) What is the expense function?

$E = 2q + 500{,}000$

b) If the price is set at \$20, what quantity will be demanded?

$q = -300(20) + 10{,}000$

$\boxed{q = 4000}$

c) If q = 1,000 widgets, find E, the cost (expense) of producing them.

$E = 2(1000) + 500{,}000$

$\boxed{E = \$502{,}000}$

12. At a particular company, the monthly expense equation is $E = 50q + 40$. Its products will be sold to retailers at a wholesale price of \$60 each. How many items must be sold to reach the breakeven point?

$R = 60q$

$E = R$

$50q + 40 = 60q$

$40 = 10q$

$\boxed{4 = q}$

13. Let the expense function for a particular item be $E = -19.50p + 530$. Let the revenue function be $R = -4.5p^2 + 100p$. Determine the breakeven points.

$E = R$

$-19.50p + 530 = -4.5p^2 + 100p$

$4.5p^2 - 119.50p + 530 = 0$

$a = 4.5,\ b = -119.5,\ c = 530$

$x = \dfrac{-(-119.5) \pm \sqrt{(-119.5)^2 - (4 * 4.5 * 53}}{2 * 4.5}$

$x = \dfrac{119.5 \pm \sqrt{14{,}280.25 - 9540}}{9}$

$x = \dfrac{119.5 \pm \sqrt{4740.25}}{9}$

$x = \dfrac{119.5 \pm 68.85}{9}$

$\boxed{20.\overline{8}}$

$\boxed{5.22\overline{7}}$

14. Determine the expense E for a production if $E = 82q + 850$, p = \$32, and $q = 24p + 705$.

$q = 24(32) + 705$

$q = 1473$

$E = 82(1473) + 850$

$= 120{,}786 + 850$

$= \boxed{121{,}636}$