

Name \_\_\_\_\_

12. A construction company is hired to build a bridge for the county.

- The company charges the county for materials according to the formula:  $C = 2000 + 1.1m$  where  $m$  is the amount the construction company pays for materials for the bridge.
  - The company charges the county for labor according to the formula:  $L = 14h + 5000$  where  $h$  is the hours of labor the employees of the construction company spend building the bridge.
- a. What is the fee for ordering materials?
  - b. What percent has the company marked up the materials it buys?
  - c. What is the fee for having the workers build the bridge?
  - d. What is the hourly rate of the construction workers?
  - e. Write an equation for  $T$ , the for the total cost of bridge.
  - f. Describe the meaning of your variables in part e.
  - g. The materials cost the construction company \$950,000. Rewrite the equation in terms of the total cost and hours of work.
  - h. The budget for the project is 1.1 million dollars. What is the domain for the hours of work in order to stay within budget? What is the range of the total cost for the project?
  - i. The project cost the county exactly 1.1 million dollars. 10 construction workers each worked a standard 40 hour week on the bridge project. How long did the construction of the bridge take?
  - j. **\*\*challenge\*\*** The county wants the project completed in exactly 6 weeks and are willing to pay for overtime pay in order to achieve the goal. The construction workers receive time and a half for overtime (1.5\*their normal pay for all hours past 40 in a given week). How much over budget does the additional cost of overtime cause the project to run?

13. Write yes/no in the table to describe if the point is a solution to the equation:

	(0, 0)	(2, 1)	(-2, -3)	(4, -2)
$y = -\frac{1}{2}x$				
$y = x - 1$				
$y = -\frac{3}{2}x + 4$				
$y = 3x$				

14. Match the correlation to the correct description.

Correlation	Description
$r = -.8$	There is weak evidence that y will increase as x increases
$r = .31$	There is strong evidence that y will increase as x increases
$r = -.22$	There is weak evidence that y will decrease as x increases
$r = .93$	There is strong evidence that y will decrease as x increases

15. Match the correlation to the correct description.

Correlation	Description
$r = -.16$	There is weak evidence that y will increase as x increases
$r = .011$	There is strong evidence that y will increase as x increases
$r = .89$	There is weak evidence that y will decrease as x increases
$r = -.83$	There is strong evidence that y will decrease as x increases
$r = .41$	There is no evidence that y will change when x increases

Name \_\_\_\_\_

16. The heights and width of hands are measured for 100 NBA players. The correlation coefficient is  $r = .94$

Complete the sentence: There is \_\_\_\_\_ evidence that hand width will \_\_\_\_\_ as height increases.

17. Five hundred college graduates were asked the value of their parents home and how much they owed in college student loans.

a. Which is a logical value of the correlation:  $r = -.7$        $r = -.2$        $r = .4$        $r = .9$

b. Explain your answer from part a.

c. Complete: There is \_\_\_\_\_ evidence that college student loan debt will \_\_\_\_\_ as the value of their parent's home increases.

18. Eighty track athletes complete a throw of a shot-put and a discuss and the results are graphed.

a. Which is a logical value of the correlation:  $r = -.93$        $r = -.31$        $r = .42$        $r = .83$

b. Explain your answer from part a.

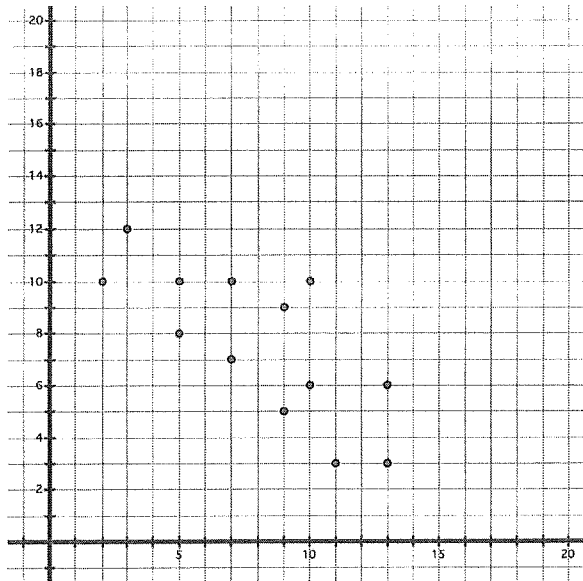
c. Complete: There is \_\_\_\_\_ evidence that length of shot-out will \_\_\_\_\_ as the length of discuss increases.

19. Use the graph below to answer the following questions

- Complete: There is \_\_\_\_\_ evidence that the y-value will \_\_\_\_\_ as the x-value increases.
- Which set of slope ( $m$ ) and y-intercept ( $b$ ) is most reasonable for the best-fit line?

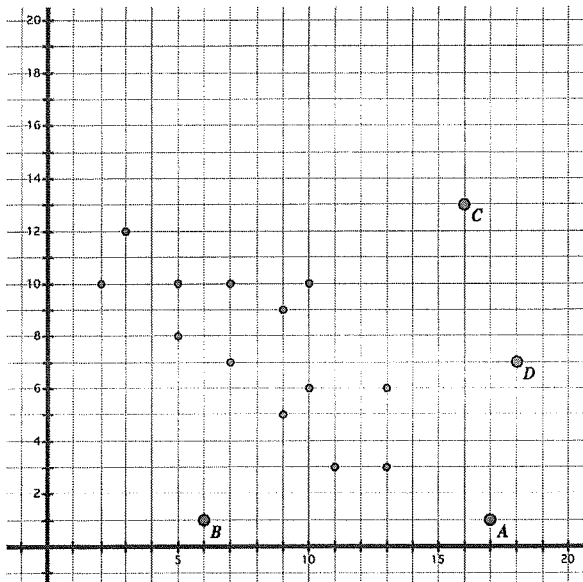
$m = -.2$	$m = -.6$	$m = .6$	$m = .2$
$b = 18$	$b = 13$	$b = 11$	$b = 12$

- State the location of the point for which its removal would improve the correlation.

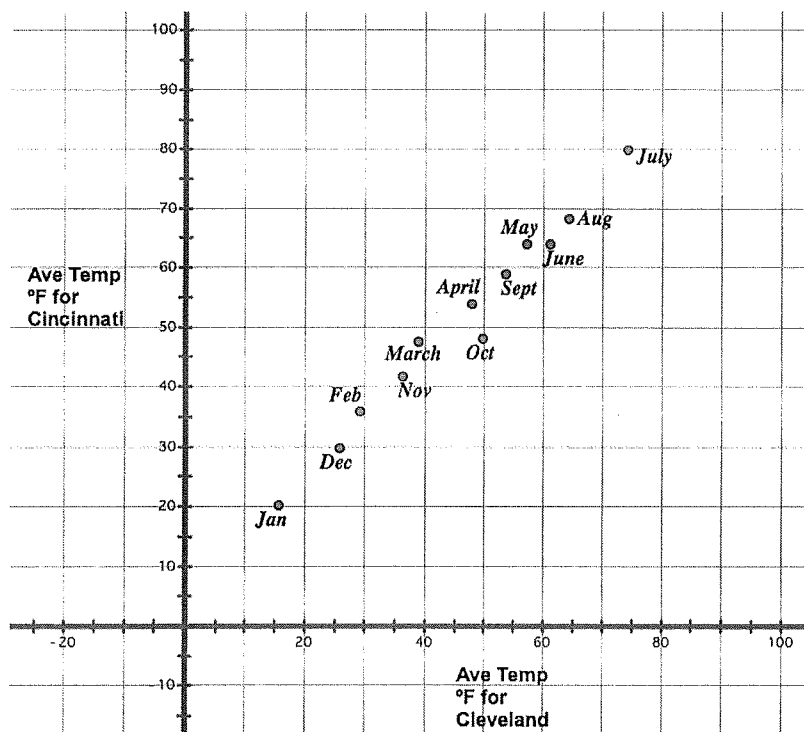


20. A point will be added to the plot from number 19. The potential locations for the new point are labeled A through D in the graph below:

- Which of the points would cause the slope of the best-fit line to increase the most?
- Which of the points would cause the slope of the best fit line to decrease the most?
- Which of the points would have the least impact upon the correlation?
- Which of the points would cause the correlation to weaken the most?



21. The average temperature for each month is tracked for Cincinnati and Cleveland and is graphed below.



- Which month was the coldest? Warmest?
- Which city is warmer?
- Which month serves as a counter-example to your answer to part b?
- What is a reasonable value for the y-intercept of the best-fit line for the data?
- Consider predicting the temperature in Cincinnati using the temperature in Cleveland. Which of the following must be true about the slope ( $m$ )?
 

$m < -1$        $-1 < m < 0$        $0 < m < 1$        $m > 1$
- Consider predicting the temperature in Cincinnati using the temperature in Cleveland. Which of the following is a reasonable correlation value?
 

$r = -.8$        $r = -.3$        $r = 0$        $r = .5$        $r = .9$
- Given a linear equation in the form:  $Cinci = m \cdot cleve + b$  which part of the equation describes how much warmer it is in Cincinnati? Explain.
- Consider predicting the temperature in Cleveland using the temperature in Cincinnati. Which of the following must be true about the slope ( $m$ )?
 

$m < -1$        $-1 < m < 0$        $0 < m < 1$        $m > 1$

12

A construction company is hired to build a bridge for the county.

- The company charges the county for materials according to the formula:  $C = 2000 + 1.1m$  where  $m$  is the amount the construction company pays for materials for the bridge.
- The company charges the county for labor according to the formula:  $L = 14h + 5000$  where  $h$  is the hours of labor the employees of the construction company spend building the bride.

a. What is the fee for ordering materials?

\$ 2000

b. What percent has the company marked up the materials it buys?

1.1 → 110% the markup is 10%

c. What is the fee for having the workers build the bridge?

\$5000

d. What is the hourly rate of the construction workers?

\$14 per hour

e. Write an equation for the total cost of bridge.

named T

$$T = C + L$$

$$T = 2000 + 1.1m + 5000 + 14h$$

$$T = 7000 + 1.1m + 14h$$

f. Describe the meaning of your variables in part e.

↑ total cost      ↑ amt. Constr. Comp. pay for materials      ↑ hours of labor

g. The materials cost the construction company \$950,000. Rewrite the equation in terms of the total cost and hours of work.

$$m = 950000$$

$$T = 7000 + 1.1(950000) + 14h$$

$$T = 1,052,000 + 14h$$

h. The budget for the project is 1.1 million dollars. What is the domain for the hours of work in order to stay within budget? What is the range of the total cost for the project?

$$1,100,000 = 1,052,000 + 14h$$

$$48000 = 14h$$

$$h = 3428.6 \text{ hours of work (Maximum)}$$

Domain  $0 \leq h \leq 3428$

Range  $1052000 \leq T \leq 1100000$

i. The project cost the county exactly 1.1 million dollars. 10 construction workers each worked a standard 40 hour week on the bridge project. How long did the construction of the bridge take?

$$3428 \text{ hours} \div 10 = 342.8 \text{ hours per worker}$$

$$342.8 \div 40 = 8.57 \text{ weeks}$$

between 8-9 weeks

j. \*\*challenge\*\* The county wants the project completed in exactly 6 weeks and are willing to pay for overtime pay in order to achieve the goal. The construction workers receive time and a half for overtime (1.5\*their normal pay for all hours past 40 in a given week). How much over budget does the additional cost of overtime cause the project to run?

$$14 \times 1.5 = 21 \leftarrow \text{overtime rate}$$

$$3428 \div 6 = 571 \text{ hours per week.}$$

$$571 \div 10 = 57.1 \text{ hours per worker per week}$$

$$\text{One worker, One week: } 40 \text{ hrs} \times \$14 + 17.1 \text{ hrs} \times \$21 = \$919.10 \text{ per worker per week}$$

$$919.10(10)(6) = 55146$$

$$55146 - 47992 = 7154 \text{ extra in labor costs}$$

\* ↓

3428 x 14 = 47992 amount w/o overtime

13

Write yes/no in the table to describe if the point is a solution to the equation:

	(0, 0)	(2, 1)	(-2, -3)	(4, -2)
① $y = -\frac{1}{2}x$	yes	no	No	yes
② $y = x - 1$	no	yes	yes	no
③ $y = -\frac{3}{2}x + 4$	no	yes	No	yes
④ $y = 3x$	yes	no	no	no

For Number 1, put  $y_1 = (-\frac{1}{2})x$  into the calculator, press 2nd table  
And see if the x-value maps to the given y-value.

14

Match the correlation to the correct description.

Correlation

Description

- $r = -.8$  — There is weak evidence that y will increase as x increases
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- $r = -.22$  — There is weak evidence that y will decrease as x increases
- $r = .93$  — There is strong evidence that y will decrease as x increases

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Match the correlation to the correct description.

Correlation

Description

- $r = -.16$  — There is weak evidence that y will increase as x increases
- $r = .011$  — There is strong evidence that y will increase as x increases
- $r = .89$  — There is weak evidence that y will decrease as x increases
- $r = -.83$  — There is strong evidence that y will decrease as x increases
- $r = .41$  — There is no evidence that y will change when x increases

\*

16 The heights and width of hands are measured for 100 NBA players. The correlation coefficient is  $r = .94$

Complete the sentence: There is strong evidence that hand width will increase as height increases.

17 Five hundred college graduates were asked the value of their parents home and how much they owed in college student loans.

As Home value  $\uparrow$  debt  $\downarrow$  = neg. corr.

a. Which is a logical value of the correlation:  $r = -.7$      $r = -.2$      $r = .4$      $r = .9$

b. Explain your answer from part a. As Home value increases, debt will go down  
negative correlation, likely strong

c. Complete: There is strong evidence that college student loan debt will decrease as the value of their parent's home increases.

18 Eighty track athletes complete a throw of a shot-put and a discuss and the results are graphed.

a. Which is a logical value of the correlation:  $r = -.93$      $r = -.31$      $r = .42$      $r = .83$

b. Explain your answer from part a. Long shot put = Long discuss = pos corr.

c. Complete: There is strong evidence that length of shot-out will increase as the length of discuss increases.



\*  
19

below

Use the graph ~~at the right~~ to answer the following questions

a. Complete: There is strong evidence that the y-value will decrease as the x-value increases.

(m) (b)

\* b. Which set of slope and y-intercept is most reasonable for the best-fit line?

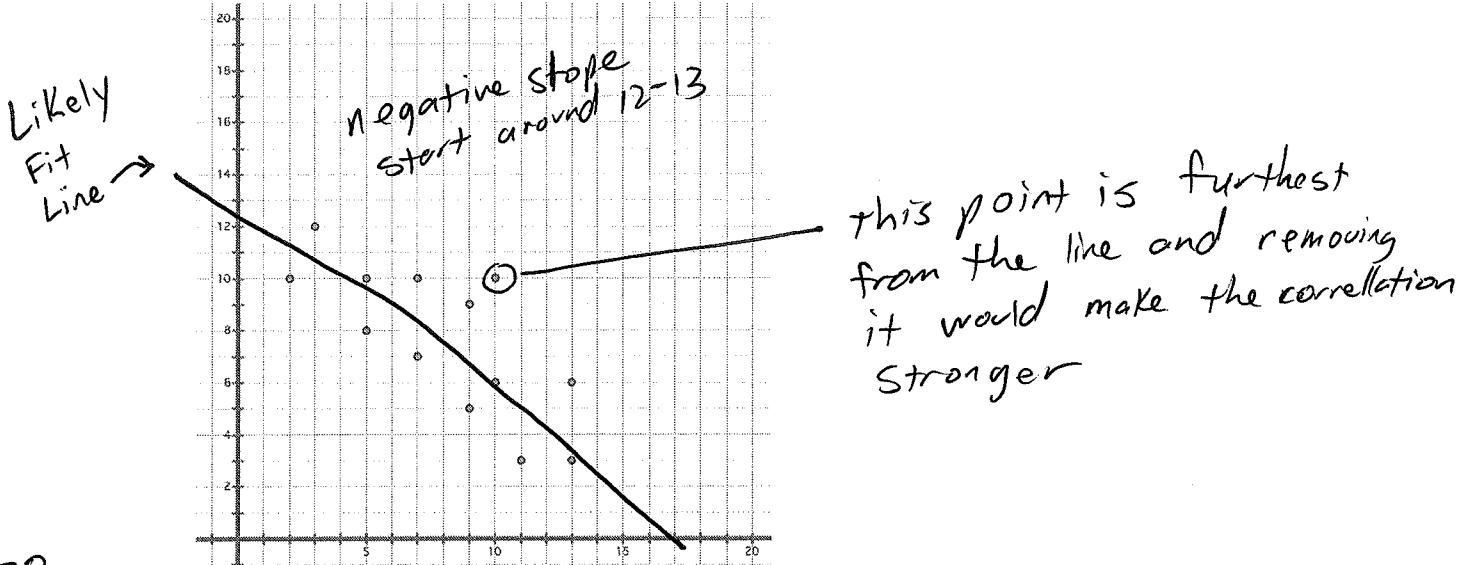
$m = -.2$   
 $b = 18$

$m = -.6$   
 $b = 13$

$m = .6$   
 $b = 11$

$m = .2$   
 $b = 12$

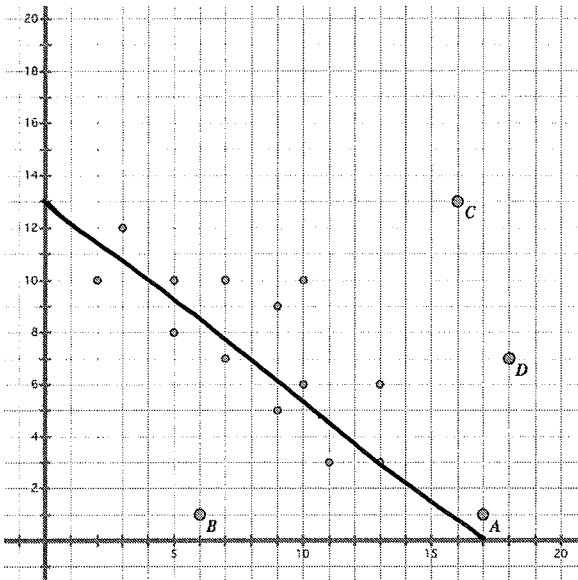
c. State the location of the point for which its removal would improve the correlation.



20

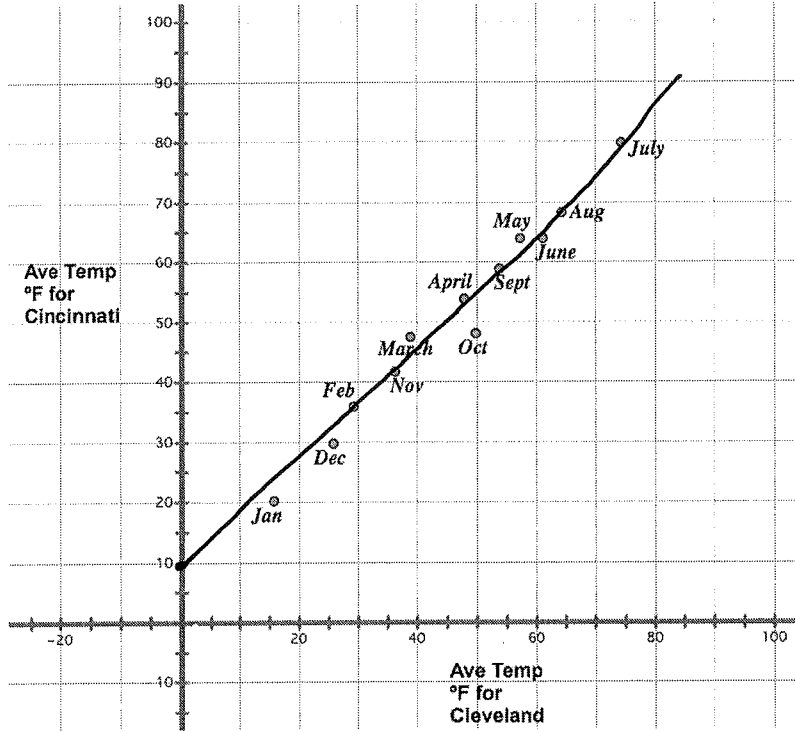
A point will be added to the plot from number ~~18~~ 19. The potential locations for the new point are labeled A through D in the graph below:

- a. Which of the points would cause the slope of the best-fit line to increase the most? **C**
- b. Which of the points would cause the slope of the best fit line to decrease the most? **B**
- c. Which of the points would have the least impact upon the correlation? **A = ~~the~~ closest to line**
- d. Which of the points would cause the correlation to weaken the most? **C = furthest from line**



21

The average temperature for each month is tracked for Cincinnati and Cleveland and is graphed below.



a. Which month was the coldest? Warmest?

Jan July

b. Which city is warmer? Cincinnati

c. Which month serves as a counter-example to your answer to part b? October = Clevland = 50 Cincinnati = 48

d. What is a reasonable value for the y-intercept of the best-fit line for the data?

5-10

\* e. Consider predicting the temperature in Cincinnati using the temperature in Cleveland. Which of the following must be true about the slope ( $m$ )? Slope pos.

$m < -1$

$-1 < m < 0$

$0 < m < 1$

$m > 1$

Cinci =  $m \cdot$  Clev.  
 $m$  must be greater than 1

f. Consider predicting the temperature in Cincinnati using the temperature in Cleveland. Which of the following is a reasonable correlation value?

$r = -.8$

$r = -.3$

$r = 0$

$r = .5$

$r = .9$

Clev. =  $m \cdot$  Cinci  
 $m$  must be a decimal

g. Given a linear equation in the form:  $Cinci = m \cdot clev + b$  which part of the equation describes how much warmer it is in Cincinnati? Explain.  $b$  describes this because on the y-axis tells the temp in Cinci when it is 0° in Clev.

h. Consider predicting the temperature in Cleveland using the temperature in Cincinnati. Which of the following must be true about the slope?

$m < -1$

$-1 < m < 0$

$0 < m < 1$

$m > 1$