Grade 8 Mathematics EOG (GSE) Quiz

Statistics and Probability - (MGSE8.SP.3) Equation Of A Linear Model

Student Name: _____

Date: _____

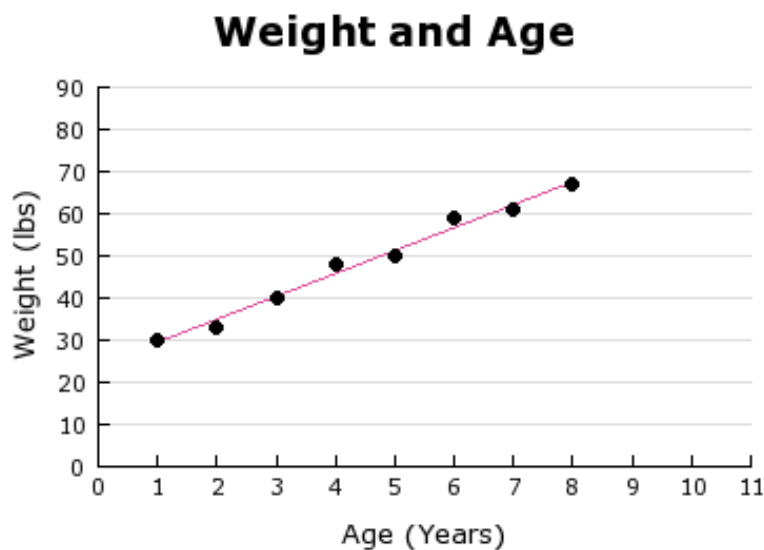Teacher Name: THUYNGA DAO

Score: _____

1)

Using the line of best fit, what is the best approximation for the hourly rate of an individual with 6 years of experience?

A) $10

B) $11

C) $12

D) $13

2)

The graph shows Jessica's weight as it compares to her age. Using the line of best fit what is the best approximation for Jessica's weight at age 9?

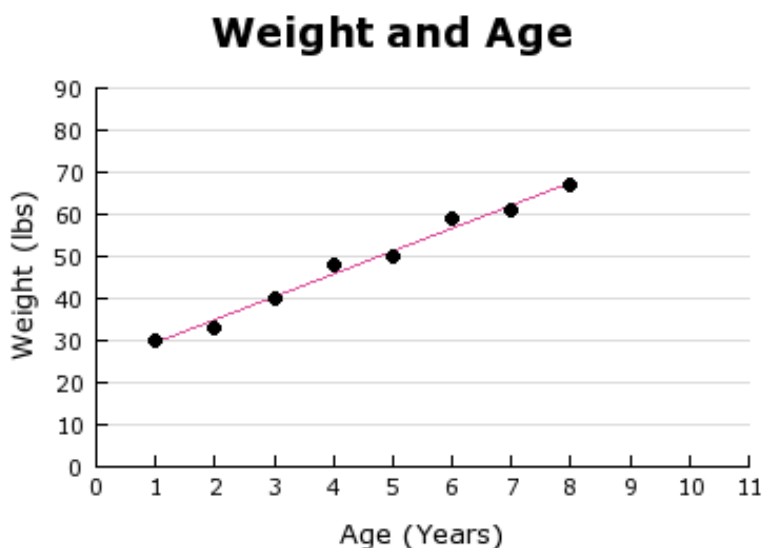A) 70 pounds

B)   75 pounds
C)   80 pounds
D)   85 pounds

3)

Rain Fall (x)	13.1	11.4	16.0	15.1	21.4	12.9	9.6	18.2	18.6
Yield (y)	48.5	44.2	56.8	80.4	47.2	29.9	74.0	74.0	76.8

In an area of the Midwest, records were kept on the relationship between the rainfall (in inches) and the yield of wheat (bushels per acre). The data for a 9 year period is given in the table. The equation of the line of best fit for this data is y = 47.3 + 0.78x. How many bushels of wheat per acre can be predicted if it is expected that there will be 17 inches of rain?

A)   5.96
B)   52.06
C)   60.56
D)   65.34

4)

Weight and Age

The graph shows Jessica's weight as it compares to her age.

Using the line of best fit what is the best approximation for Jessica's weight at age 10?

A)   60 pounds
B)   70 pounds
C)   80 pounds
D)   90 pounds

5) Managers at a company rate employee's on performance and attitude and find that an employee's attitude depends on their performance. They find a linear relationship and the line of best fit is $y = 11.7 + 1.02x$. What does 1.02 mean in the context of the problem?

A)   That if their attitude rating was 0 the performance rating would be 1.02.
B)   That if the performance rating was 0, their attitude rating would be 1.02.
C)   That for every point their performance rating goes up their attitude rating improves by 1.02 points.
D)   That for every point their attitude rating goes up their performance rating improves by 1.02 points.

6) Managers at a company rate employee's on performance and attitude and find that an employee's attitude depends on their performance. They find a linear relationship and the line of best fit is $y = 11.7 + 1.02x$. If the performance rating increased by 2 points what would happen to the attitude rating?

   A)   It would increase by 2.04 points.
   B)   It would increase by 11.25 points.
   C)   It would increase by 23.4 points.
   D)   It would increase by 0.089 points.

7) Profit is equal to the revenue obtained from selling items minus the cost of producing those items, i.e. P(x) = R(x) − C(x) where x is the number of items produced. If C(x) = 0.5x + 3 and R(x) = 2.5x, what should the production level, x, be to generate a profit of $99?

   A)   50
   B)   51
   C)   52
   D)   53

8) Steven investigates the amount of damage to the head gaskets on the trucks in his fleet and finds that the damage index depends on the ambient temperature. He develops the equation $y = \frac{-2}{3}x + 14$ to model the relationship. If the temperature increases 1 degree, what happens to the damage index for the head gasket?

   A)   It decreases by 14 points.
   B)   It decreases by 21 points.
   C)   It decreases by 0.047 points.
   D)   It decreases by $\frac{2}{3}$ of a point.

9) Olivia is growing roses and keeps track of how much fertilizer (in ounces) she adds to the soil and how many blooms each rose bush has. She finds a linear relationship that can be modeled by the equation $y = 1.345x + 4$. When will Olivia only have 4 blooms?

   A)   When she adds no fertilizer.
   B)   Every bush will only have 4 blooms.
   C)   When she only adds 1 ounce of fertilizer.
   D)   It is not possible for her to only have 4 blooms.

10) Sven investigates the amount of damage to the head gaskets on the trucks in his fleet and find that the damage index depends on the ambient temperature. He develops the equation $y = \frac{-2}{3}x + 14$ to model the relationship. What does 14 mean?

   A)   The temperature only adds 14 to the damage index.
   B)   If there is no damage index then the ambient temperature is 14.
   C)   If the damage index is 0, then the ambient temperature would be 0.
   D)   If the ambient temperature is 0 then the damage index would be 14.

11) Margot is studying the yield of bushels of wheat in comparison to the amount of rainfall, in inches, that occurs. She finds the linear regression equation to be $y = 47.3 + 0.78x$.

If an additional 1 inch of rain fell, how many MORE bushels of wheat would be yielded?

   A)   0.78
   B)   47.3
   C)   48.08
   D)   60.64

12) Straight-line depreciation is a method of calculating an asset's value by subtracting its salvage value from its acquisition or purchase price divided by the estimated useful life of the asset.

Suppose a manufacturing robot cost $1.5 million in 2005 and is sold in 2010 for $50,000. What is the linear equation representing the value of the robot? [t is measured in years, V is measured in thousands.]
- A)   V(t)= 290t + 50
- B)   V(t) = 1500t + 50
- C)   V(t) = 290t − 1500
- D)   V(t) = 1500 − 290t

13) Jackie bought a new 7.1 cubic foot chest freezer. The owners manual states that the temperature inside the freezer needs to be below 32°F before any perishable food can be stored. The ambient temperature is 78°F. If the freezer's temperature is modeled by the linear equation $y = -\dfrac{59}{3}x + 78$, how long will it be before Jackie can put steaks in her freezer?

- A)   2 hours
- B)   2 hours 20 minutes
- C)   2 hours 40 minutes
- D)   3 hours

14) A snow storm left 1.25 feet of snow on the ground overnight. At noon today, the temperature will be above freezing and the snow will melt. If the melting snow is modeled by the equation $y = -\dfrac{1}{3}x + 1.25$, how long will it take for the snow to melt away?

- A)   3 hours 5 minutes
- B)   3 hours 30 minutes
- C)   3 hours 45 minutes
- D)   4 hours

15) Olivia is growing roses and keeps track of how much fertilizer (in ounces) she adds to the soil and how many blooms each rose bush has. She finds a linear relationship that can be modeled by the equation $y = 1.345x + 4$. What does the 1.345 mean in the context of the problem?
- A)   That she must add 1.345 ounces of fertilizer every day.
- B)   That every day she found an additional 1.345 blooms on her rose bushes.
- C)   That for every additional bloom on the rose bush she added 1.345 ounces of fertilizer.
- D)   That for every ounce of fertilizer she adds there is an additional 1.345 blooms on the rose bush.

16) Jamal owns a parking garage and is trying to find the relationship between hour of the day and number of cars in the garage. He finds that between 4 am and 10 am he can model this with a linear relationship. The equation for this model is $y = 3.56x + 2$. About how many cars are entering the garage every hour?
- A)   1
- B)   2
- C)   3
- D)   4

17) Jill has a hot tub that holds 1,260 gallons of water. She needs to drain the hot tub, so that it can be moved to a new location in her backyard. If draining the hot tub is modeled by the equation $y = -\dfrac{793}{2}x + 1{,}260$, how long will it take to drain the hot tub?

- A)   2 hours 48 minutes
- B)   2 hours 59 minutes
- C)   3 hours 11 minutes
- D)   3 hours 22 minutes

18) George lives over 15 miles away from the nearest grocery store. Today he bought a gallon of milk along with some other groceries. By the time he got home and put the milk in his refrigerator the milk was already 58°F. George will only drink milk that is

37°F or colder. If the temperature of the milk is modeled by the linear equation y = - $\frac{12}{13}$ x + 58, how long will it be before George will

drink the milk? (round to nearest whole minute)

  A)   19 minutes
  B)   21 minutes
  C)   23 minutes
  D)   25 minutes