

## 8.SP.3 Trimester Review

- 1) By examining past tournaments, it's possible to calculate the probability that a school wins their first game in the national college basketball tournament.

Rank	2	5	6	8	9	11
Probability (%)	96	74	65	52	45	35

Each school's rank going into the tournament is a strong indicator of their likelihood of winning their first game. This can be expressed as  $y = -6.88x + 108$  where  $x$  is their rank (out of 16) and  $y$  is the percent chance they have of winning their first game.

- a) What does the slope of the line represent?
- b) What does the y-intercept of this function represent?
- c) According to the model, a school ranked #4 has what probability of winning their first game? Round your answer to the nearest percent.
- d) Based on this model, a school with a 87% chance of winning their first game would have what rank? Round your answer to the nearest whole number.
- 2) Economists have found that the amount of corruption in a country is correlated to the productivity of that country. Productivity is measured by gross domestic product (GDP) per capita. Corruption is measured on a scale from 0 to 100 with 0 being highly corrupt and 100 being least corrupt:

Corruption Score	19	26	39	43	60	66
GDP Per Capita (\$)	2,660	5,450	6,650	10,700	22,800	27,800

This can be modeled by the equation  $y = 535x - 9900$  where  $x$  is the corruption score and  $y$  is GDP per capita in dollars.

- a) What does the slope of the line represent?
- b) What does the y-intercept of this function represent?
- c) According to the model, what would be the GDP per capita of a country with a corruption score of 51? Round your answer to the nearest dollar.
- d) A GDP per capita of \$6,700 corresponds to what corruption score, according to the model? Round your answer to the nearest whole number.

- 3) The Hurricane Hunters took the following measurements from a hurricane over several days as it developed:

Air Pressure (kPa)	922	946	969	978	991	1,002
Wind Speed (knots)	126	113	59.5	61.9	45.8	35.2

They found that the air pressure and wind speed are related in the following way:  $y = -1.22x + 1260$  where  $x$  is the air pressure in millibars (kPa) and  $y$  is the maximum sustained wind speed in knots (nautical miles per hour).

- What does the slope of the line represent?
- What does the y-intercept of this function represent?
- Using the model, what would be the wind speed of a hurricane with an air pressure of 935 kPa? Round your answer to the nearest knot.
- The model indicates that a wind speed of 94 knots is associated with what air pressure? Round your answer to the nearest millibar.

- 4) The height and weight of several adults were recorded:

Height (ft)	4.55	4.95	5.4	5.9	6.15	6.35
Weight (lbs)	92	108	130	161	175	181

It was discovered that this can be modeled by the equation  $y = 51.8x - 147$  where  $x$  is height in feet and  $y$  is weight in pounds.

- What does the slope of the line represent?
- What does the y-intercept of this function represent?
- Using this model, what would be the weight of someone who is 5.6 ft tall? Round your answer to the nearest tenth.
- What height corresponds to a weight of 120 pounds? Round your answer to the nearest hundredth.

## Answers to 8.SP.3 Trimester Review

- 1) Slope: Change in percent chance of winning first game for every change in rank  
Y-intercept: The probability that the school ranked #0 will win their first game  
80%, 3rd
- 2) Slope: The increase in GDP per capita for every increase of one in corruption score  
Y-intercept: The GDP per capita of a country with a corruption score of zero  
\$17,385, 31
- 3) Slope: The change in wind speed for every 1 kPa increase in air pressure  
Y-intercept: The wind speed of a hurricane with an air pressure of 0 kPa  
119 knots, 956 kPa
- 4) Slope: The number of pounds heavier an adult one foot taller would weigh  
Y-intercept: The weight of an adult zero feet tall  
143.1 lbs, 5.15 ft