

Summer Packet 2019-2020

The purpose of this summer work is to help prepare you for your upcoming math class. The work will tap into your prior knowledge and review past content, concepts, and skills. Our expectation is that you arrive on the first day of school able to demonstrate mastery of the material in this packet. In order to achieve this, please allow yourself plenty of time to work on the problems, use your resources (such as the review materials provided, Khan Academy, or the math faculty here at the school during the summer to specifically help with the summer work (July 15th — Aug 15th on Tues and Wed from 8:30 to 10:30 by appointment)), and work each problem to completion.

This work will be due on **Thursday, September 5th and Friday, September 6th**, and will be 3% of your first quarter grade. 10% will be deducted for each day it is late. Summer work will not be accepted after Sept. 12th. Each math problem in the packet will be graded as follows:

Summer Work Assignments	Grading	Evidence	Perseverance
You may complete the Written Packet	One and a half points will be awarded per problem attempted. One point will be awarded for each correct answer.	Students will show all necessary work for credit.	Students will show their work when solving a problem. If they are struggling, they will seek out extra help.

Your teacher might choose to give a non-graded assessment on the first week of school in order to target remediation strategies and requirements.

A note from your Probability and Statistics teacher:

This packet will help you to sharpen your skills and be ready for the first day of the 2018-2019 school year. These problems shouldn't take too long. HAVE A GREAT SUMMER!!!!

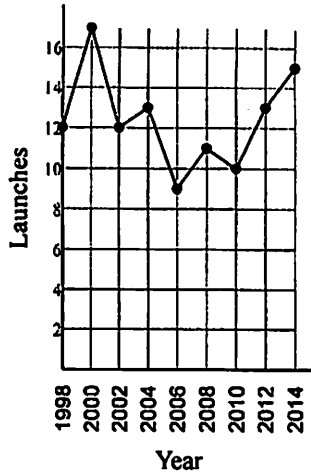
Summer Work Topics for Probability and Statistics

- a. Statistics
 - Mean, Median, Mode
 - Draw Graphs, Tables
 - Regression
- b. Probability
 - Independent/ Dependent
 - Mutually Exclusive

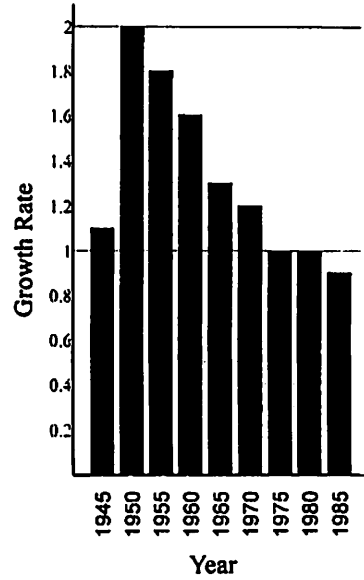
Statistics

Find the mode, median, and mean for each data set.

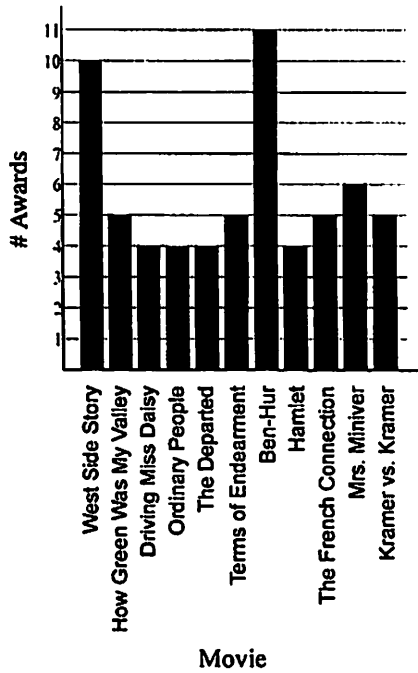
1) European Spacecraft Launches



2) US Population Growth



3) Academy Awards



4) Goals in a Hockey Game

Goals	Frequency
2	1
5	6
7	2
9	2

5) Mens Heights (Inches)

76 66 75 77 75 72 76
71 76 66 67

6) Hits in a Round of Hacky Sack

8 12 5 4 4 8 2 3
8 5 2

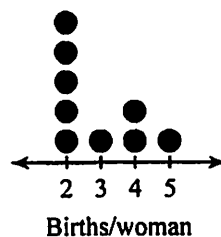
7) Basketball Tournament

School	Appearances	School	Appearances	School	Appearances
Eastern Michigan	4	Ohio State	27	Monmouth	4
UNC Greensboro	2	Alabama A&M	1	UNLV	20
Norfolk State	1	Samford	2	Portland	2
Virginia Commonwealth	14				

8) Goals in a Hockey Game

Goals	Frequency
5	1
6	2
7	4
8	2
9	1
10	1

9) Birth Rate by Country



10) Test Scores

45 53 50 53 55 54 47
40 47 39

Draw a dot plot for each data set.

11) Birth Rate

Country	Births/woman
Seychelles	2
Turkmenistan	2
Armenia	2
Tunisia	2
Russia	2
Ireland	2
Antigua & Barbuda	2
Zimbabwe	4
Sierra Leone	5

12) # Words in Book Titles

1 1 1 2 2 2 2 3
4 5

13) Age at First Job

14	14	15	16	17	18	18
18	19	19	22			

14) Basketball Tournament Champions

School	Times Won
UNLV	1
UTEP	1
Stanford	1
Oregon	1
Michigan State	2
San Francisco	2
Cincinnati	2
Connecticut	4
North Carolina	5

15) Age At Inauguration

President	Age	President	Age	President	Age	President	Age
John F Kennedy	43	John Tyler	51	Benjamin Harrison	55	William H Harrison	68
James A Garfield	49	Jimmy Carter	52	Andrew Johnson	56	Ronald Reagan	69
Millard Fillmore	50	Abraham Lincoln	52				

Draw a stem-and-leaf plot for each data set.

16) Boiling Point

Substance	°C	Substance	°C
Phosphorus	280.5	Gold	2,856
Glycerol	290	Cobalt	2,870
Calcium	1,484	Nickel	2,913
Lead	1,750	Plutonium	3,232
Silver	2,162	Platinum	3,825
Silicon	2,357		

17) Per Capita Income

Country	US \$	Country	US \$
Comoros	1,559	Tunisia	11,092
Vanuatu	2,991	Suriname	16,226
Kyrgyzstan	3,212	Azerbaijan	17,139
Swaziland	6,683	Cyprus	29,450
Bhutan	7,669	Oman	44,052
Mongolia	9,433		

18) Life Expectancy

Country	Years	Country	Years
Guinea	55	Paraguay	74.7
Burkina Faso	56.5	Bahrain	77
Cameroon	61.5	Czech Republic	78
Belarus	72.5	Lebanon	80.5
Nauru	73	Greece	81
Tonga	74.5		

19) Basketball Tournament

School	Appearances	School	Appearances	School	Appearances
East Carolina	2	Jacksonville	5	Providence	17
Eastern Washington	2	Delaware	5	BYU	29
Jackson State	3	Southern California	15	Syracuse	37
Coastal Carolina	4				

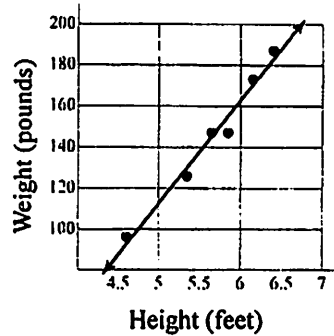
20) Injuries Due to Distracted Driving per Month

6,461	6,782	6,896	7,213	7,568
7,580	7,680	7,753	7,946	9,010

21) The height and weight of several adults were recorded:

Height (ft)	Weight (lbs)
4.6	96.2
5.35	126
5.65	147
5.85	147
6.15	173
6.4	187

It was discovered that this can be modeled by the equation $y = 50.3x - 139$ where x is height in feet and y is weight in pounds.



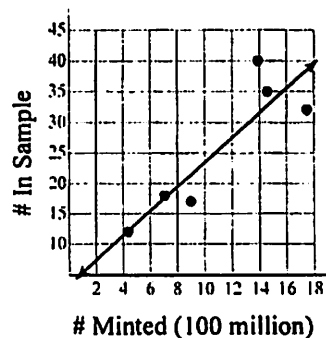
a) What does the y-intercept of this function represent?

b) Using this model, what would be the weight of someone who is 5.2 ft tall? Round your answer to the nearest tenth.

22) Ryan collects coins. Over a three-year period he collected 1,000 nickels. After organizing them by year, he found that the number of nickels from a given year was related to the number minted that year:

Minted (100 mill.)	In Sample
4.4	12
7.1	18
9	17
13.9	40
14.6	35
17.5	32

Ryan discovered that this can be modeled by the equation $y = 2.01x + 3.41$ where x is the number of nickels minted in a particular year in hundreds of millions and y is the number of nickels from that year in his sample.



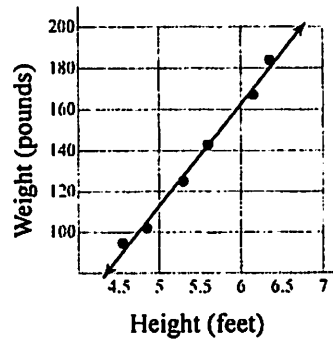
a) What does the y-intercept of this function represent?

b) Using this model, in a sample of 1,000 nickels how many would you expect to be from a year in which 10.8 hundred million were minted? Round your answer to the nearest whole number.

23) The height and weight of several adults were recorded:

Height (ft)	Weight (lbs)
4.55	94.6
4.85	102
5.3	125
5.6	143
6.15	167
6.35	184

It was discovered that this can be modeled by the equation $y = 49.8x - 137$ where x is height in feet and y is weight in pounds.



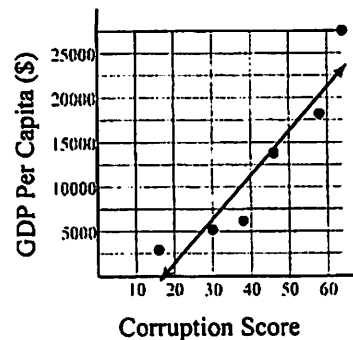
a) What does the y-intercept of this function represent?

b) Using this model, what would be the weight of someone who is 5.1 ft tall? Round your answer to the nearest tenth.

24) 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	GDP Per Capita (\$)
16	2,900
30	5,190
38	6,160
46	13,800
58	18,200
64	27,500

This can be modeled by the equation $y = 496x - 8530$ where x is the corruption score and y is GDP per capita in dollars.



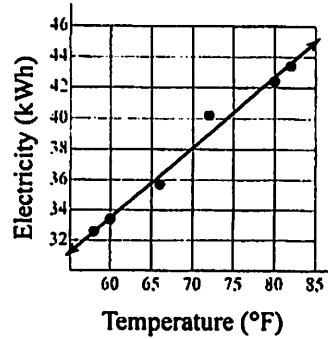
a) What does the y-intercept of this function represent?

b) According to the model, what would be the GDP per capita of a country with a corruption score of 25? Round your answer to the nearest dollar.

25) Households consume much more electricity when the weather is warmer:

Temperature (°F)	Electricity (kWh)
58	32.6
60	33.4
66	35.7
72	40.2
80	42.4
82	43.4

This can be modeled by the equation $y = 0.459x + 5.94$ where x is the average daily temperature in °F and y is the average amount of electricity consumed in kilowatt-hours (kWh).



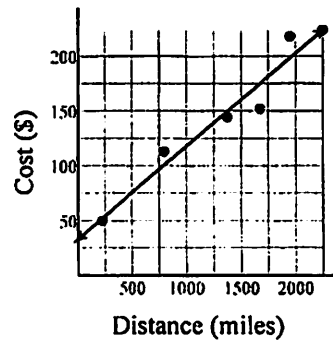
a) What does the y-intercept of this function represent?

b) Using the model, how much electricity would be consumed if the average daily temperature was 75°F? Round your answer to the nearest kilowatt-hour.

26) The cost of a flight is related to the distance traveled:

Miles	Cost (\$)
225	49.8
800	113
1,375	144
1,675	152
1,950	218
2,250	224

This can be modeled by the equation $y = 0.0849x + 33.1$ where x is distance in miles and y is cost in dollars.

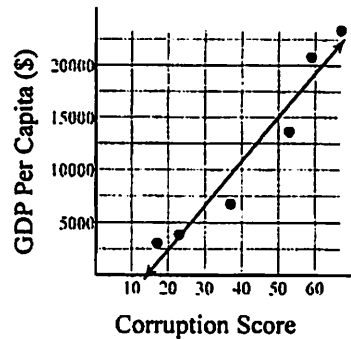


What distance corresponds to a cost of \$130? Round your answer to the nearest mile.

27) 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	GDP Per Capita (\$)
17	3,030
23	3,860
37	6,750
53	13,600
59	20,800
67	23,400

This can be modeled by the equation $y = 420x - 6000$ where x is the corruption score and y is GDP per capita in dollars.

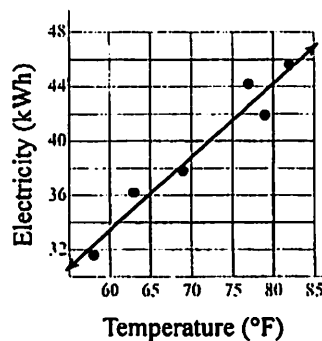


A GDP per capita of \$7,000 corresponds to what corruption score, according to the model? Round your answer to the nearest whole number.

28) Households consume much more electricity when the weather is warmer:

Temperature (°F)	Electricity (kWh)
58	31.6
63	36.2
69	37.8
77	44.2
79	41.9
82	45.6

This can be modeled by the equation $y = 0.54x + 1.04$ where x is the average daily temperature in °F and y is the average amount of electricity consumed in kilowatt-hours (kWh).

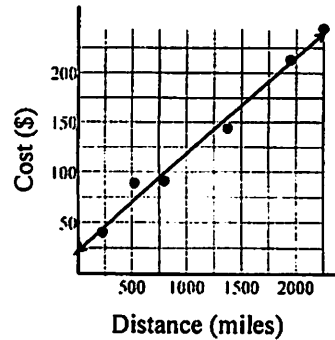


What temperature would it need to reach in order for 40 kWh to be consumed? Round your answer to the nearest degree.

- 29) The cost of a flight is related to the distance traveled:

Miles	Cost (\$)
225	40.1
525	89
800	91
1,375	144
1,950	213
2,250	244

This can be modeled by the equation $y = 0.0969x + 21.8$ where x is distance in miles and y is cost in dollars.

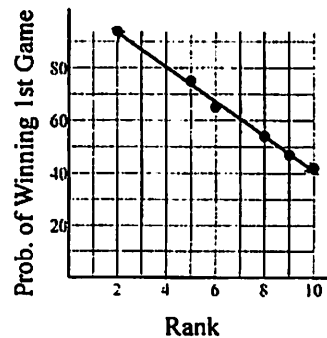


What distance corresponds to a cost of \$130? Round your answer to the nearest mile.

- 30) 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	Probability (%)
2	94
5	75
6	65
8	54
9	47
10	42

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 $y = -6.58x + 107$ where x is their rank (out of 16) and y is the percent chance they have of winning their first game.



Based on this model, a school with a 81% chance of winning their first game would have what rank? Round your answer to the nearest whole number.

Probability

Find the probability.

- 31) A bag contains seven red marbles and three blue marbles. You randomly pick a marble and then return it to the bag before picking another marble. Both the first and second marbles are red.
- 32) A spinner has an equal chance of landing on each of its seven numbered regions. You spin twice. The first spin lands in region six and the second spin lands in region one.
- 33) You flip a coin and then roll a fair six-sided die. The coin lands heads-up and the die shows an even number.
- 34) You flip a coin twice. The first flip lands tails-up and the second flip lands heads-up.
- 35) You flip a coin twice. The first flip lands heads-up and the second flip lands tails-up.
- 36) There are ten shirts in your closet, five blue and five green. You randomly select one to wear on Monday and then a different one on Tuesday. You wear blue shirts both days.

- 37) A box of chocolates contains seven milk chocolates and eight dark chocolates. You randomly pick a chocolate and eat it. Then you randomly pick another piece. The first piece is milk chocolate and the second piece is dark chocolate.
- 38) There are six nickels and five dimes in your pocket. You randomly pick a coin out of your pocket and place it on a counter. Then you randomly pick another coin. Both coins are nickels.
- 39) Your sock drawer has six white socks, six brown socks, and two black socks. You randomly pick a sock and put it on your left foot and then pick another sock and put it on your right foot. You leave the house with a white sock on your left foot and a brown sock on your right foot.
- 40) A box of chocolates contains four milk chocolates and five dark chocolates. You randomly pick a chocolate and eat it. Then you randomly pick another piece. Both pieces are milk chocolate.
- 41) A litter of kittens consists of two gray kittens, two black kittens, and two mixed-color kittens. You randomly pick one kitten. The kitten is gray or mixed-color.
- 42) A spinner has an equal chance of landing on each of its five numbered regions. After spinning, it lands in region one or five.

- 43) There are ten shirts in your closet, three blue, four green, and three red. You randomly select one to wear. It is blue or green.
- 44) A magazine contains twelve pages. You open to a random page. The page number is seven or eleven.
- 45) A jar contains four balls, numbered from one to four. You randomly pick a ball. It is numbered one or two.
- 46) A jar contains three orange marbles numbered one to three. The jar also contains three green marbles numbered one to three. You randomly pick a marble. It is orange or has an even number.
- 47) You roll a fair six-sided die. The die shows an even number or a number greater than four.
- 48) A cooler contains eleven sports drinks: seven lemon-lime and four orange. Two of the lemon-lime and two of the orange drinks are cold. The others are still warm. You randomly grab a bottle. It is orange flavored or cold.
- 49) A bag contains six yellow jerseys numbered one to six. The bag also contains four purple jerseys numbered one to four. You randomly pick a jersey. It is purple or has a number greater than three.
- 50) A bag contains four yellow tickets numbered one to four. The bag also contains six green tickets numbered one to six. You randomly pick a ticket. It is yellow or has a number less than five.