

Class Name : **Math 6**

Instructor Name : **Ms. Swanson**

Student Name : \_\_\_\_\_

Instructor Note : **Period** \_\_\_\_\_

1. An aquarium tank holds 570 liters of water. How much is this in gallons? Use the following conversion: 1 gallon is 3.8 liters.

2. A water dispenser has a capacity of 15,000 milliliters. What is its capacity in *liters* (L)?

\_\_\_\_\_ L

3. Here are some facts about units of weight.

Unit	Symbol	Fact
ounce	oz	
pound	lb	1 lb = 16 oz
ton	T	1 T = 2000 lb

Fill in the blanks.

$$2 \text{ lb} = \underline{\hspace{2cm}} \text{ oz}$$

$$12,000 \text{ lb} = \underline{\hspace{2cm}} \text{ T}$$

4. For each value of  $v$ , determine whether it is a solution to  $v - 36 = 11$ .

$v$	Is it a solution?	
	Yes	No
64	<input type="radio"/>	<input type="radio"/>
47	<input type="radio"/>	<input type="radio"/>
45	<input type="radio"/>	<input type="radio"/>
52	<input type="radio"/>	<input type="radio"/>

5. For each value of  $v$ , determine whether it is a solution to  $35 < 5v$ .

$v$	Is it a solution?	
	Yes	No
7	<input type="radio"/>	<input type="radio"/>
11	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>

6. Jenny has a bookcase with 6 shelves. There are  $m$  books on each shelf. Using  $m$ , write an expression for the total number of books.

7. Translate this phrase into an algebraic expression.

21 increased by twice a number

Use the variable  $n$  to represent the unknown number.

8. Translate this sentence into an equation.

*The product of Jenny's savings and 8 is 144.*

Use the variable  $j$  to represent Jenny's savings.

9. Solve for  $w$ .

$$w + 6.99 = 9.87$$

10. Solve for  $b$ .

$$7 = 35b$$

Simplify your answer as much as possible.

11. Solve for  $w$ .

$$30 = \frac{5}{6}w$$

Simplify your answer as much as possible.

12. Write an inequality for the following statement.

*$a$  is greater than 1*

13. Write inequalities to represent the situations below.

**The temperature inside the lab refrigerator is at most 45 °F.**

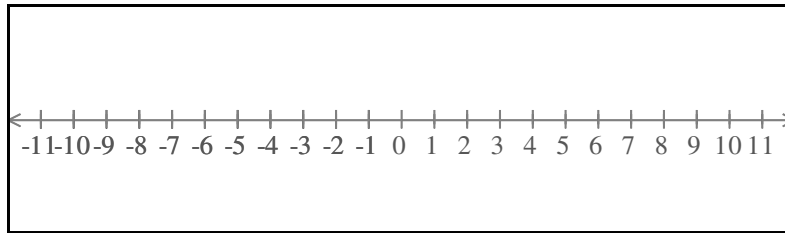
Use  $t$  to represent the temperature (in °F) of the refrigerator.

**To ride a roller coaster, a visitor must not be less than 52 inches tall.**

Use  $h$  to represent the height (in inches) of a visitor able to ride.

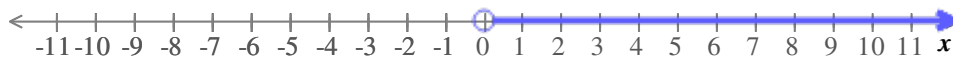
14. Graph the inequality below on the number line.

$$b \leq 10$$



15. Write an inequality for the graph shown below.

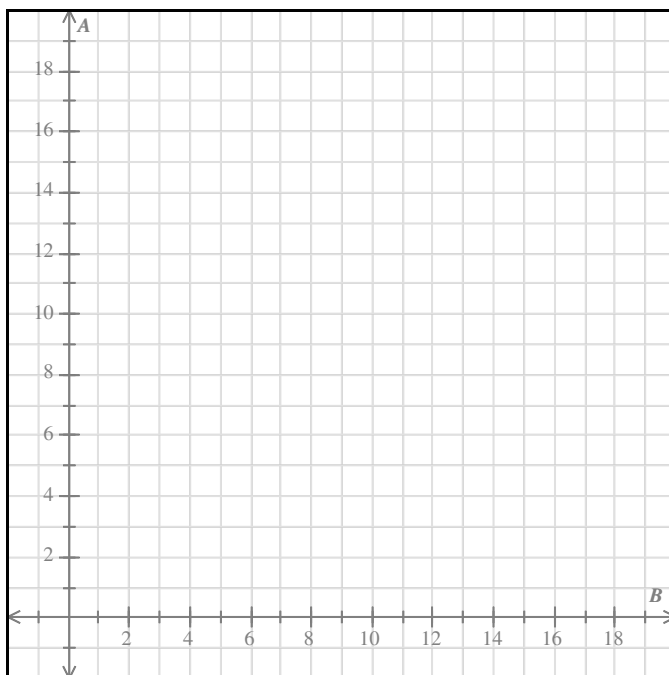
Use  $x$  for your variable.



16. Kala earns 15 dollars each hour working part-time at a bookstore. She earns one additional dollar for each book that she sells.

Let  $A$  be the amount (in dollars) that Kala earns in an hour if she sells  $B$  books.

Write an equation relating  $A$  to  $B$ . Then graph your equation using the axes below.



17. A plant is already 43 centimeters tall, and it will grow one centimeter every month.

Let  $H$  be the plant's height (in centimeters) after  $M$  months.

Write an equation relating  $H$  to  $M$ . Then use this equation to find the plant's height after 32 months.

Equation:

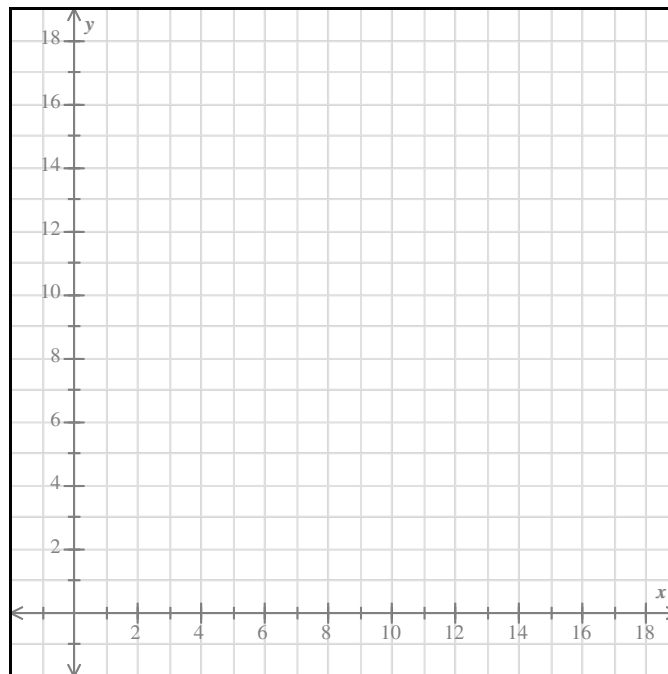
Plant's height after 32 months: \_\_\_\_\_ centimeters

18. The table shows the time (in minutes) that it took Raina to read different numbers of pages of her book.

Using  $x$  for the number of pages and  $y$  for the time, do the following.

- Plot the ordered pairs described by the table.
- Write an equation relating  $x$  and  $y$ .

Number of pages, $x$	Time, $y$ (in minutes)
1	4
2	8
3	12
4	16

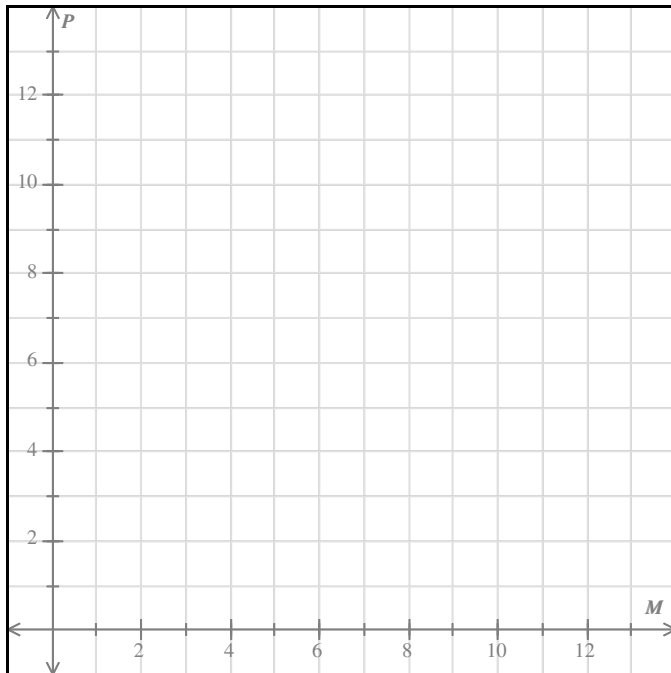


Equation: \_\_\_\_\_

19. A printer prints 2 photos each minute.

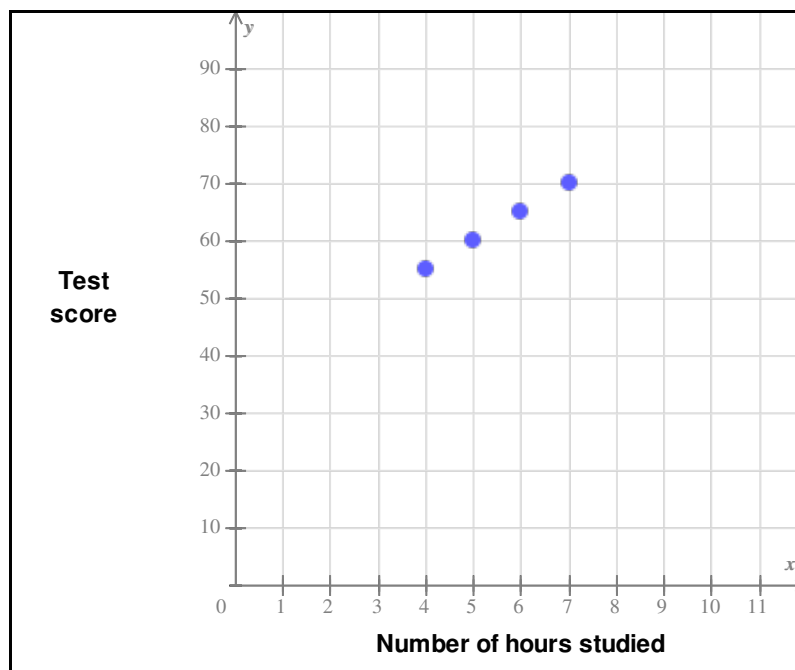
Let  $P$  be the number of photos printed in  $M$  minutes.

Write an equation relating  $P$  to  $M$ . Then graph your equation using the axes below.



20. For each situation below, identify the dependent variable and independent variable.

(a) Eric has made a graph showing how the number of hours he studied influenced his test scores.



Identify the dependent and independent variables.

Dependent variable: Choose one:

- Test score
- Number of hours studied
- Number of questions
- Number of students

Independent variable: Choose one:

- Test score
- Number of hours studied
- Number of questions
- Number of students

(b) A company that makes plastic knives is looking at its weekly sales. The table below shows how the number of knives sold is affected by the price per knife.

<b>Price per knife in cents (<math>x</math>)</b>	<b>Number of knives sold (<math>y</math>)</b>
4	2250
6	1500
8	1100
10	900

Identify the dependent and independent variables.

Dependent variable: Choose one:

- Price per knife
- Number of knives per box
- Number of knives sold
- Weight per knife

Independent variable: Choose one:

- Price per knife
- Number of knives per box
- Number of knives sold
- Weight per knife



21. A definition of a *statistical question* is given below.

**Statistical question:**

Any question whose answer could involve working with more than one data value.

In each situation below, determine whether the question is a statistical question.

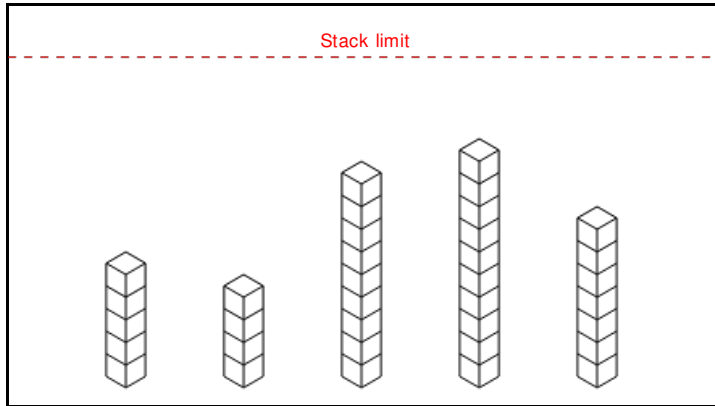
Situation	Statistical question?
(a) Mr. Phillips asked his students, "How many books did you read last month?"	<input type="radio"/> Yes <input type="radio"/> No
(b) Charlie asked one of the girls on his team, "What is the number of sports that you play?"	<input type="radio"/> Yes <input type="radio"/> No
(c) Mrs. Peterson asked one of her students, "What is the distance (in miles) from your house to school?"	<input type="radio"/> Yes <input type="radio"/> No
(d) Hong asked seventy students at his school, "How much money did you save last month?"	<input type="radio"/> Yes <input type="radio"/> No
(e) Keiko asked one of her classmates, "How many words did you type yesterday?"	<input type="radio"/> Yes <input type="radio"/> No

22. Answer the questions below.

<p>(a) Each member of the football team was asked to report the year he was born. Which measure gives the most common year of birth?</p> <p><input type="radio"/> Mean                      <input type="radio"/> Median                      <input type="radio"/> Mode</p>
<p>(b) In a survey, 9 people reported how many soft drinks they drank in the last month. Here are their responses: 28, 30, 31, 32, 33, 35, 36, 37, 39. Which measure should be used to summarize the data?</p> <p><input type="radio"/> Mean                      <input type="radio"/> Median                      <input type="radio"/> Mode</p>
<p>(c) In the past 9 days, Lucy has received the following numbers of email advertisements per day: 16, 40, 41, 44, 45, 48, 50, 51, 52. Which measure should be used to summarize the data?</p> <p><input type="radio"/> Mean                      <input type="radio"/> Median                      <input type="radio"/> Mode</p>

23. Five stacks of cubes are given below.

The numbers of cubes in the stacks are 5, 4, 9, 10, and 7.



(a) Move the cubes so that each stack has the same number of cubes.  
Then give the number of cubes in each stack.

\_\_\_\_\_

(b) What is the mean of 5, 4, 9, 10, and 7?  
(These are the numbers of cubes in the original stacks.)

\_\_\_\_\_

(c) Are the values you found in parts (a) and (b) the same? Why or why not?

- Yes. When we make the stacks equal, the number of cubes in each stack *must* be the mean of the original stacks.
- Yes. But it didn't have to turn out that way. When the stacks are made equal, the number of cubes in each stack *may not* be the mean of the original stacks.
- No. But it didn't have to turn out that way. When the stacks are made equal, the number of cubes in each stack *may* be the mean of the original stacks.
- No. When we make the stacks equal, the number of cubes in each stack *cannot* be the mean of the original stacks.

24. The salaries of the employees at four companies are summarized below. Answer the questions about them.

Company A: The mean salary is \$34,000 and the range of salaries is \$39,000 .

Company B: The mean salary is \$38,000 and the range of salaries is \$40,000 .

Company C: The mean salary is \$41,000 and the range of salaries is \$34,000 .

Company D: The mean salary is \$37,000 and the range of salaries is \$42,000 .

(a) Based on the information above, which company's salaries have the most variability?

Company A

Company B

Company C

Company D

(b) Based on the information above, which company has the lowest salaries on average?

Company A

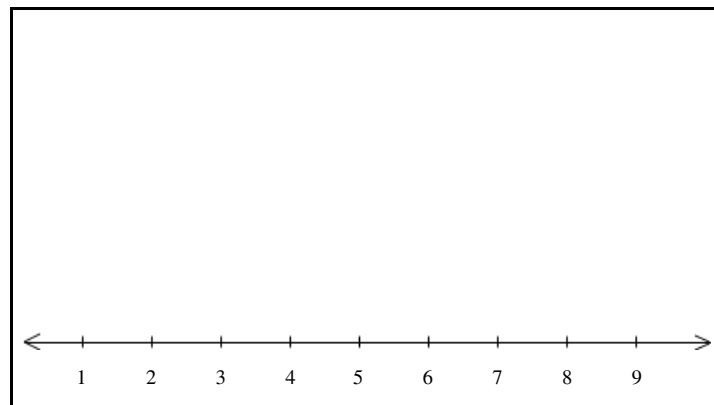
Company B

Company C

Company D

25. Draw the line plot for these numbers.

8, 5, 1, 9, 7, 8, 8, 8, 1, 5



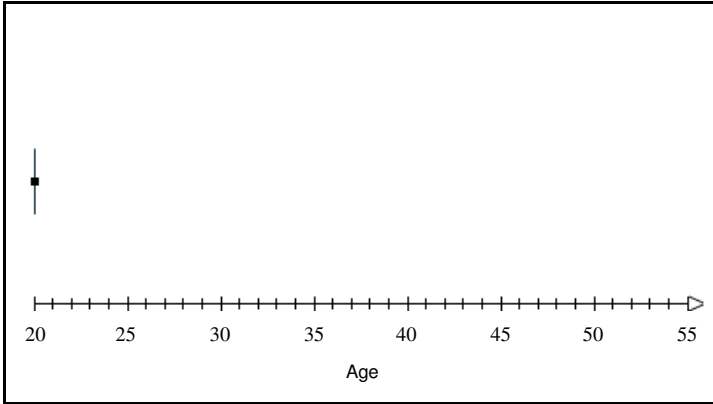
26.

The following are the ages of 17 physics teachers in a school district.

23, 24, 28, 29, 30, 31, 32, 39, 39, 40, 41, 44, 46, 46, 51, 52, 55.

Notice that the ages are ordered from least to greatest.

Make a box-and-whisker plot for the data.



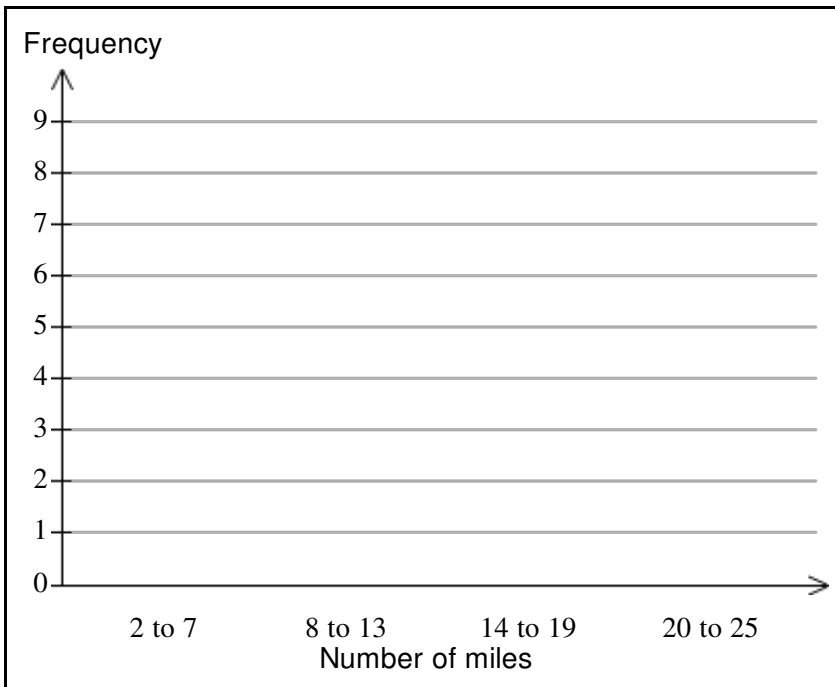
27. Eighteen cyclists were each asked the number of miles they biked last week. Their responses are given below.

Number of miles					
24	20	12	22	23	15
11	25	12	9	10	20
3	4	10	21	25	3

(a) Complete the grouped frequency distribution for the data. (Note that the class width is 6.)

Number of miles	Frequency
2 to 7	_____
8 to 13	_____
14 to 19	_____
20 to 25	_____

(b) Construct a histogram for the data.



**28.** Keith and Carmen want to find the mean number of movies students in their class saw last year. So they each randomly select students in their class and ask for the numbers.

The results are shown below. Use the data to answer the questions.

Keith's sample:

10, 18, 19, 9, 17, 20, 11, 8. Carmen's sample:

8, 5, 9, 10.

(a)	What is the sample size for Keith's sample?  _____
(b)	What is the sample size for Carmen's sample?  _____
(c)	Suppose you had to choose one sample to estimate the mean. Which sample is more likely to give a good estimate of the mean?  <input type="radio"/> Keith's sample <input type="radio"/> Carmen's sample  Why?  <input type="radio"/> It has the smaller sample size. <input type="radio"/> It has the larger sample size. <input type="radio"/> It has the smaller mean. <input type="radio"/> It has the larger mean.

29. Hans wants to find the average time it takes West High School students to run a lap around the track. So he will consider 24 students to find the average time.

Answer the questions below.

(a) Which unit(s) could be used for the unit of measurement? Check all that apply.

pounds     seconds     ounces     minutes     grams

(b) Which of the procedures below would be the best way to find the average time?

Randomly pick 24 students to run a lap around the track and have them state their own times.

Randomly pick 24 students to run a lap around the track and measure their times.

Measure the times of 24 volunteers who run a lap around the track.

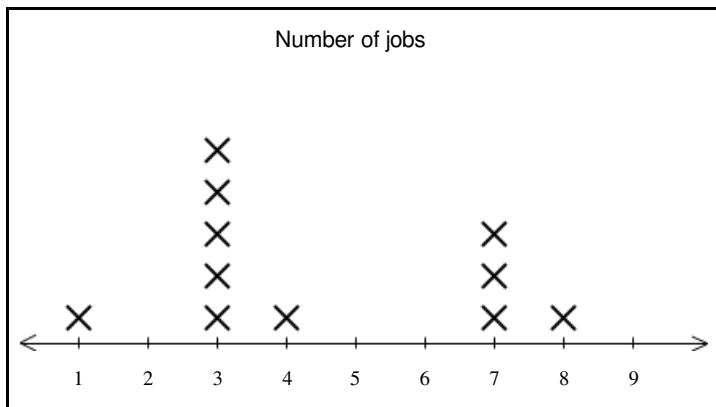
Ask for 24 volunteers to run a lap around the track and have them state their own times.

30. The following list gives the number of siblings for each of 9 students.

1, 2, 0, 4, 2, 1, 1, 4, 4.

Find the modes of this data set.

31. Eleven adults were asked how many different jobs they have had. Their answers are shown in the line plot below.



Find the mode and the range for the data.

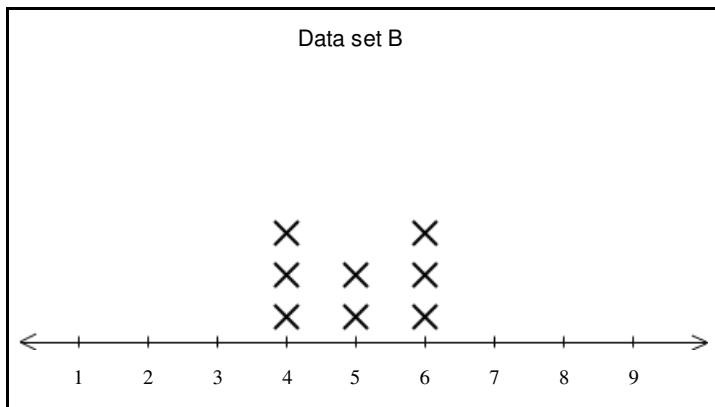
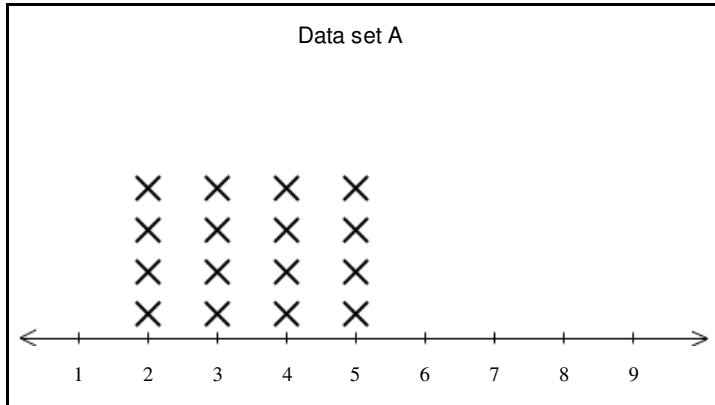
32. A pet store has 7 cats. Here are their weights (in pounds).

10, 14, 12, 6, 8, 13, 5.

Find the mean weight of these cats.

If necessary, round your answer to the nearest tenth.

33. Below are the line plots for two data sets.



Find the mean of each data set.

34. A group of 6 students was asked, "How many hours did you watch television last week?" Here are their responses:

10, 14, 5, 12, 15, 5.

Find the mean and median number of hours for these students.

If necessary, round your answers to the nearest tenth.



35. Here are yesterday's high temperatures (in Fahrenheit) in 13 U.S. cities.

50, 53, 55, 61, 64, 64, 72, 72, 74, 78, 78, 82, 83

Notice that the temperatures are ordered from least to greatest.

Give the five-number summary and the interquartile range for the data set.

**Five-number summary**

Minimum:

Lower quartile:

Median:

Upper quartile:

Maximum:

Interquartile range:

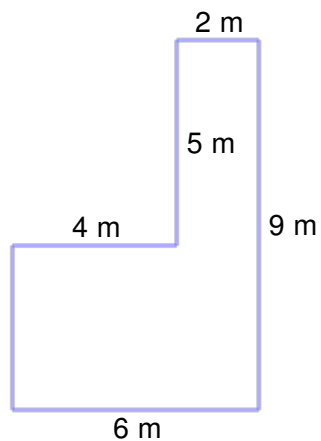
36. The data set below has 6 values.

Find the mean absolute deviation for the data set.

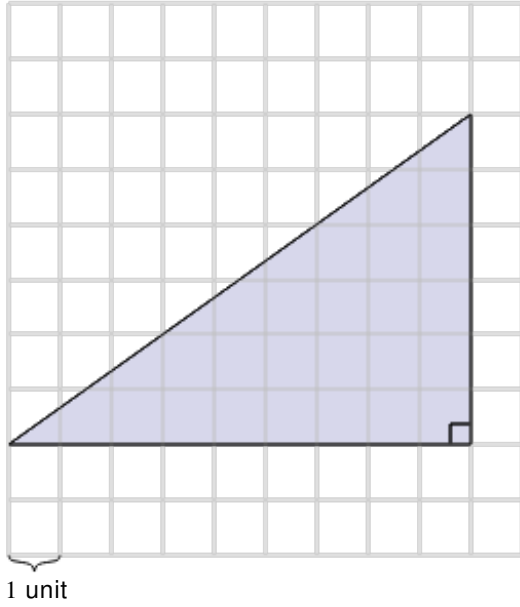
If necessary, round your answer to the nearest hundredth.

27, 15, 16, 14, 17, 13.

37. Find the area of the figure. (Sides meet at right angles.)



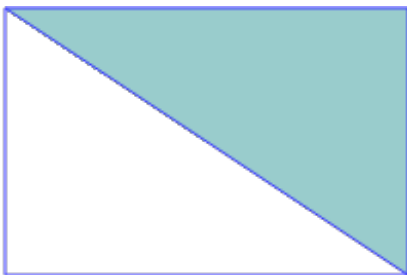
38. Find the area of the right triangle.



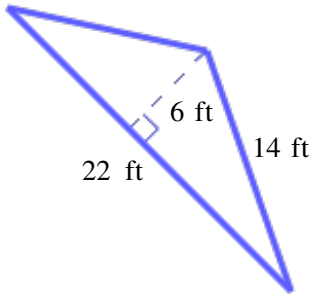
Area: \_\_\_\_\_ square units

39. The entire rectangle below has an area of  $68 \text{ cm}^2$ .

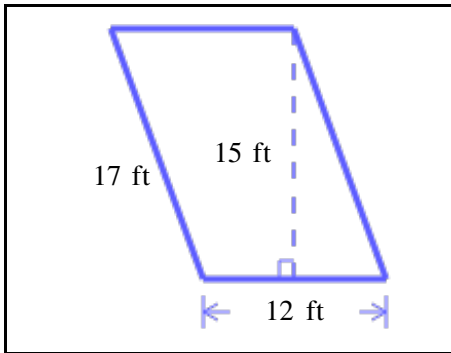
Find the area of the shaded triangle.  
Be sure to include the correct unit in your answer.



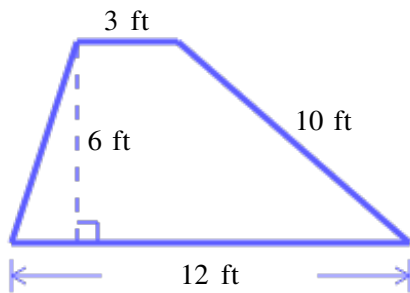
40. Find the area of the triangle below.  
Be sure to include the correct unit in your answer.



41. Find the area of this parallelogram. Be sure to include the correct unit in your answer.

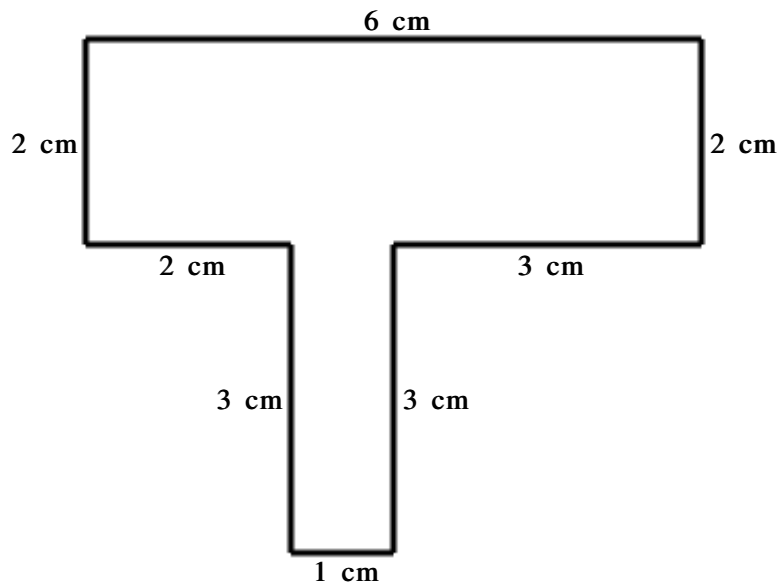


42. Find the area of this trapezoid. Be sure to include the correct unit in your answer.

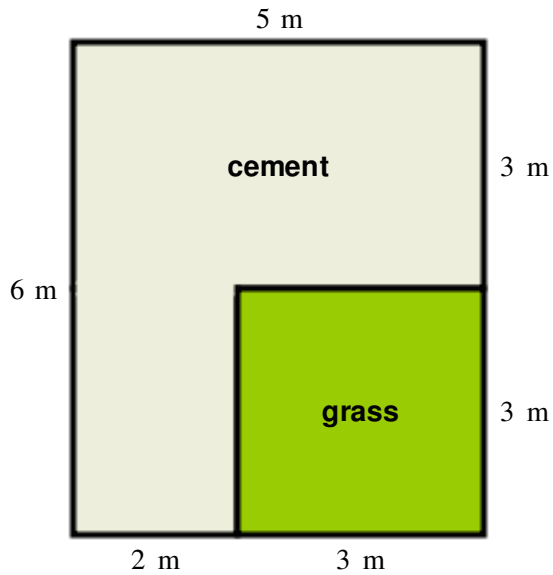


43.

Find the area of the figure.  
(Sides meet at right angles.)

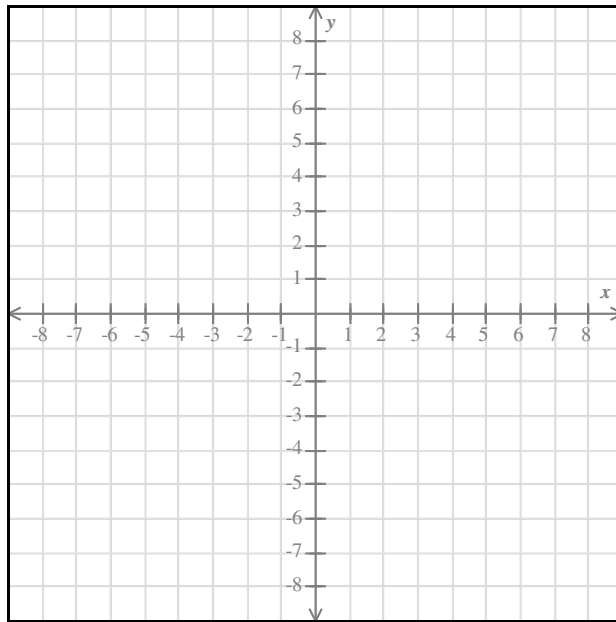


44. Amy's backyard has cement and grass. Find the area of the part with cement.  
(Sides meet at right angles.)



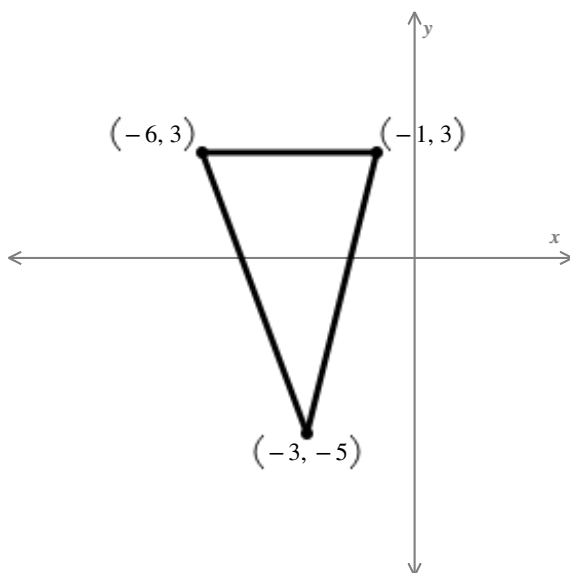
45. Draw the polygon whose vertices are  $(1, 0)$ ,  $(4, 0)$ ,  $(4, -7)$ , and  $(1, -7)$ .

Then choose the best description of the polygon from the choices below.

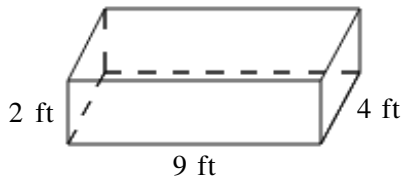


Triangle	Rectangle	Square	None of these
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

46. What is the area of the triangle?



47. The figure below shows a hollow box in the shape of a rectangular prism. Note that the box has a lid.



- (a) Use the calculator to find the surface area and volume of the box. Make sure to include the correct units.

Surface area: \_\_\_\_\_

Volume: \_\_\_\_\_

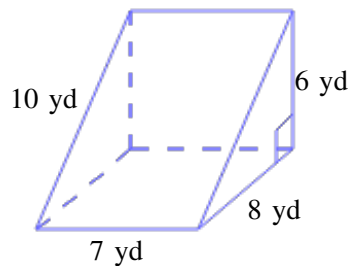
- (b) The box is to be filled with sand. Which measure would be used to find the amount of sand the box will hold?

Surface area     Volume

- (c) The box was made from wood. Which measure helped the carpenter know how much wood to buy?

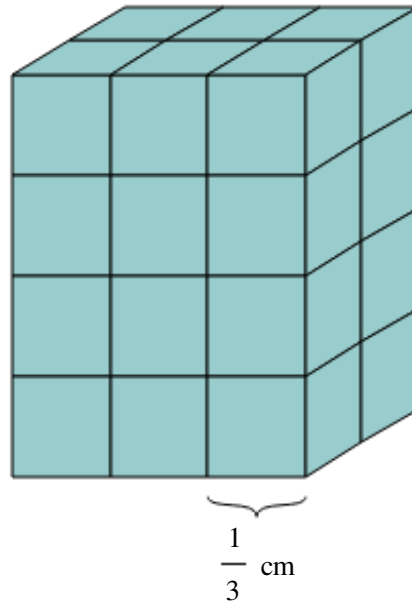
Surface area     Volume

48. Find the surface area of this triangular prism. Be sure to include the correct unit in your answer.



49. The large solid below is made from small cubes. Each has a side length of  $\frac{1}{3}$  cm.

Answer the questions below. Write your answers in simplest form.

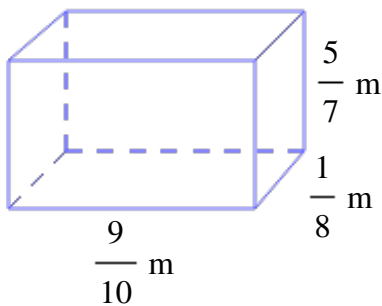


(a) How many small cubes is the large solid made of? \_\_\_\_\_

(b) What is the volume of one of the small cubes? \_\_\_\_\_  $\text{cm}^3$

(c) What is the volume of the large solid? \_\_\_\_\_  $\text{cm}^3$

50. Find the volume of the rectangular prism.  
Write your answer in simplest form.



# SEMESTER 2 EXAM #1 Answers for class Math 6

1. 150 gal

2. A water dispenser has a capacity of 15,000 milliliters. What is its capacity in *liters* (L)?

15 L

3.

2 lb = 32 oz

12,000 lb = 6 T

4.

v	Is it a solution?	
	Yes	No
64	<input type="radio"/>	<input checked="" type="radio"/>
47	<input checked="" type="radio"/>	<input type="radio"/>
45	<input type="radio"/>	<input checked="" type="radio"/>
52	<input type="radio"/>	<input checked="" type="radio"/>

5.

v	Is it a solution?	
	Yes	No
7	<input type="radio"/>	<input checked="" type="radio"/>
11	<input checked="" type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input checked="" type="radio"/>
9	<input checked="" type="radio"/>	<input type="radio"/>



6.  $6m$

7.  $21 + 2n$

8.  $8j = 144$

9.  $w = 2.88$

10.  $b = \frac{1}{5}$

11.  $w = 36$

12.  $a > 1$

13.

**The temperature inside the lab refrigerator is at most 45 °F.**

Use  $t$  to represent the temperature (in °F) of the refrigerator.

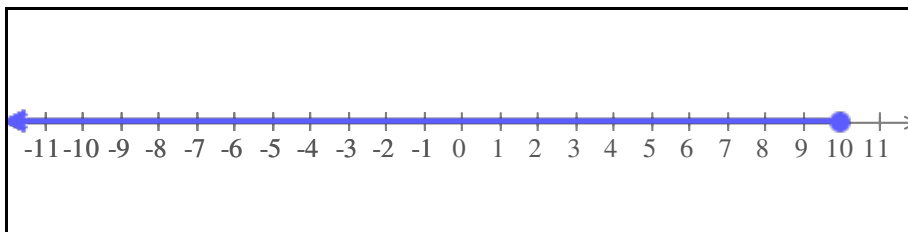
$$t \leq 45$$

**To ride a roller coaster, a visitor must not be less than 52 inches tall.**

Use  $h$  to represent the height (in inches) of a visitor able to ride.

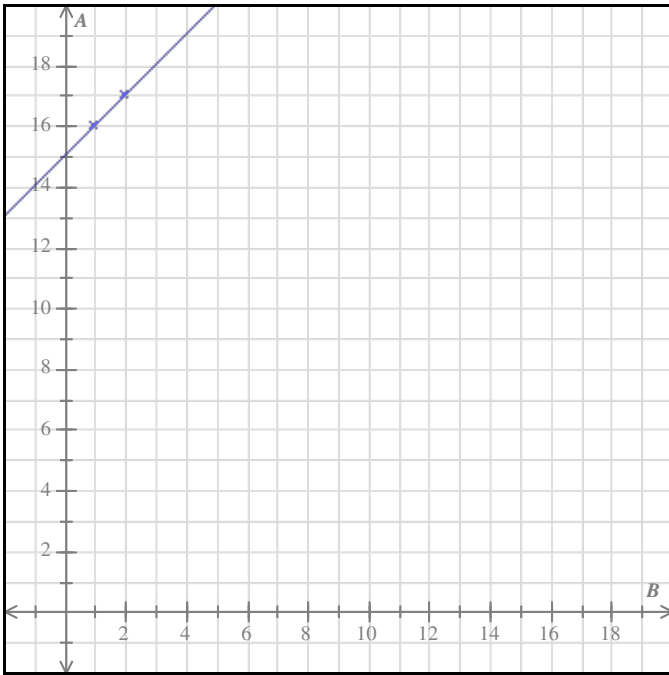
$$h \geq 52$$

14.



15.  $x > 0$

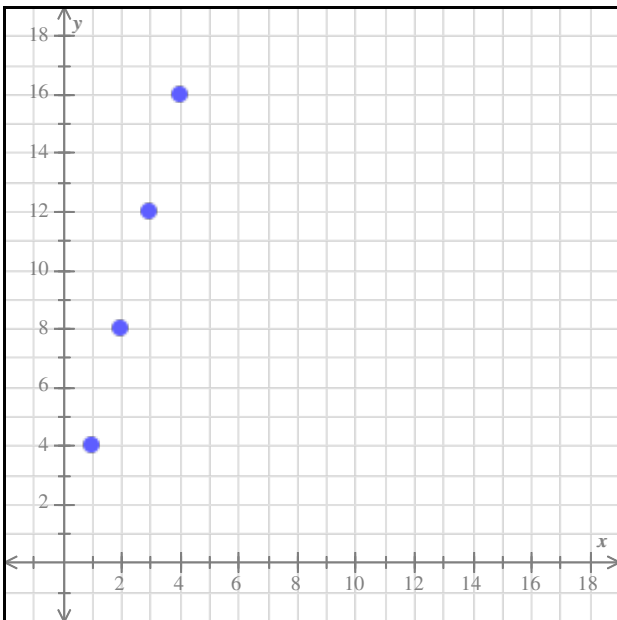
16. Equation:  $A = 15 + B$



17. Equation:  $H = 43 + M$

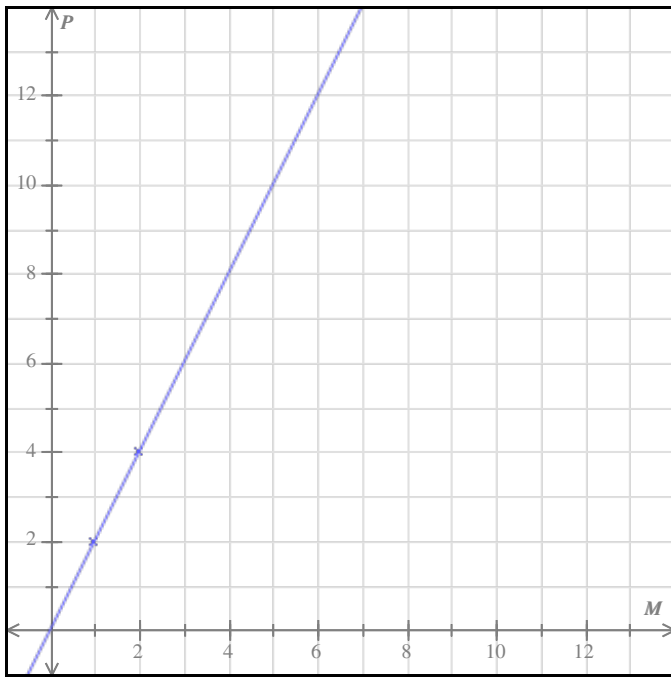
Plant's height after 32 months: 75 centimeters

18.



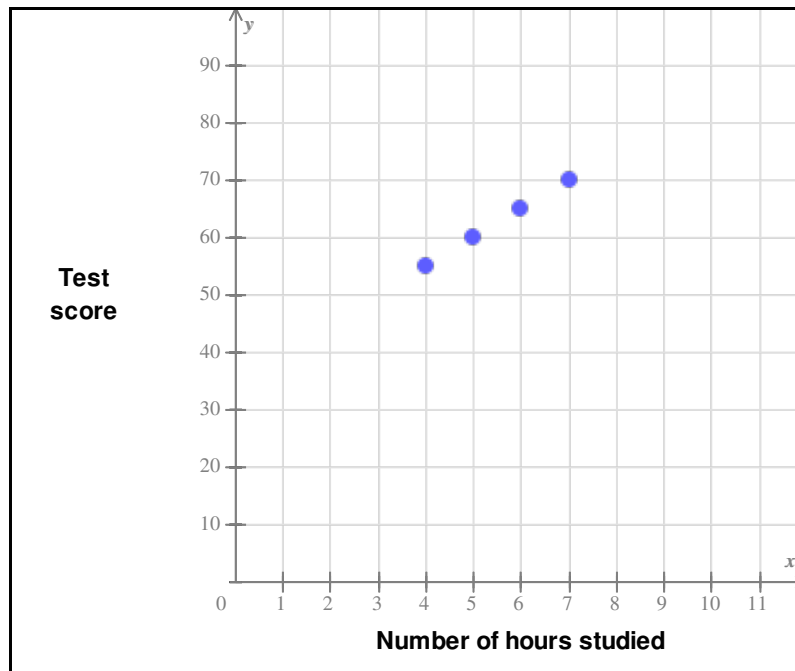
Equation:  $y = 4x$

19. Equation:  $P = 2M$



20.

(a) Eric has made a graph showing how the number of hours he studied influenced his test scores.



Identify the dependent and independent variables.

Dependent variable: Choose one:

- Test score
- Number of hours studied
- Number of questions
- Number of students

Independent variable: Choose one:

- Test score
- Number of hours studied
- Number of questions
- Number of students

(b) A company that makes plastic knives is looking at its weekly sales. The table below shows how the number of knives sold is affected by the price per knife.

<b>Price per knife in cents (<math>x</math>)</b>	<b>Number of knives sold (<math>y</math>)</b>
4	2250
6	1500
8	1100
10	900

Identify the dependent and independent variables.

Dependent variable: Choose one:

- Price per knife
- Number of knives per box
- Number of knives sold
- Weight per knife

Independent variable: Choose one:

- Price per knife
- Number of knives per box
- Number of knives sold
- Weight per knife

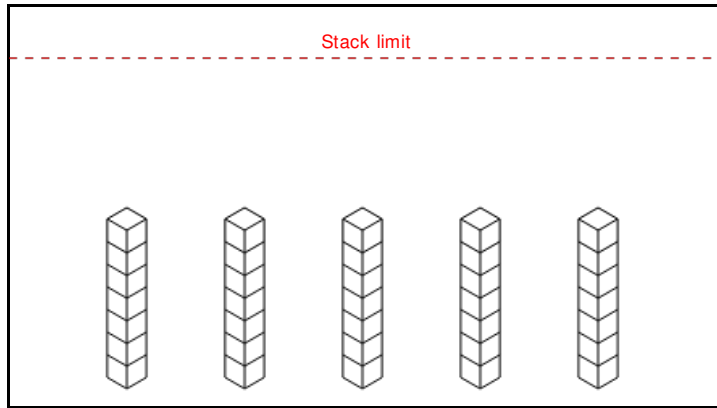
21.

Situation	Statistical question?
(a) Mr. Phillips asked his students, "How many books did you read last month?"	<input checked="" type="radio"/> Yes <input type="radio"/> No
(b) Charlie asked one of the girls on his team, "What is the number of sports that you play?"	<input type="radio"/> Yes <input checked="" type="radio"/> No
(c) Mrs. Peterson asked one of her students, "What is the distance (in miles) from your house to school?"	<input type="radio"/> Yes <input checked="" type="radio"/> No
(d) Hong asked seventy students at his school, "How much money did you save last month?"	<input checked="" type="radio"/> Yes <input type="radio"/> No
(e) Keiko asked one of her classmates, "How many words did you type yesterday?"	<input type="radio"/> Yes <input checked="" type="radio"/> No

22.

(a) Each member of the football team was asked to report the year he was born. Which measure gives the most common year of birth?  <input type="radio"/> Mean <input type="radio"/> Median <input checked="" type="radio"/> Mode
(b) In a survey, 9 people reported how many soft drinks they drank in the last month. Here are their responses: 28, 30, 31, 32, 33, 35, 36, 37, 39. Which measure should be used to summarize the data?  <input checked="" type="radio"/> Mean <input type="radio"/> Median <input type="radio"/> Mode
(c) In the past 9 days, Lucy has received the following numbers of email advertisements per day: 16, 40, 41, 44, 45, 48, 50, 51, 52. Which measure should be used to summarize the data?  <input type="radio"/> Mean <input checked="" type="radio"/> Median <input type="radio"/> Mode

23.



- (a) Move the cubes so that each stack has the same number of cubes.  
Then give the number of cubes in each stack.

7

- (b) What is the mean of 5, 4, 9, 10, and 7?  
(These are the numbers of cubes in the original stacks.)

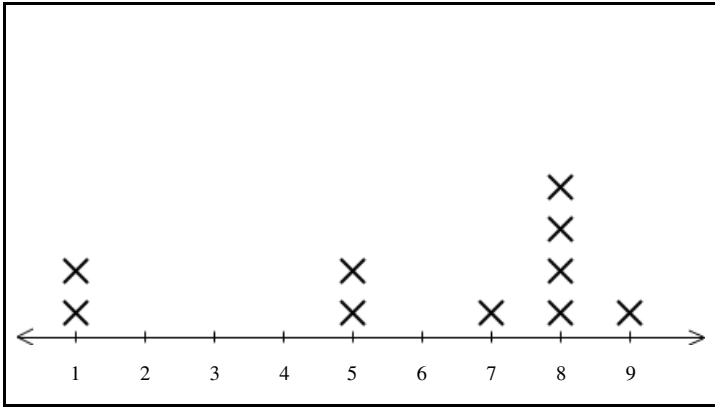
7

- (c) Are the values you found in parts (a) and (b) the same? Why or why not?

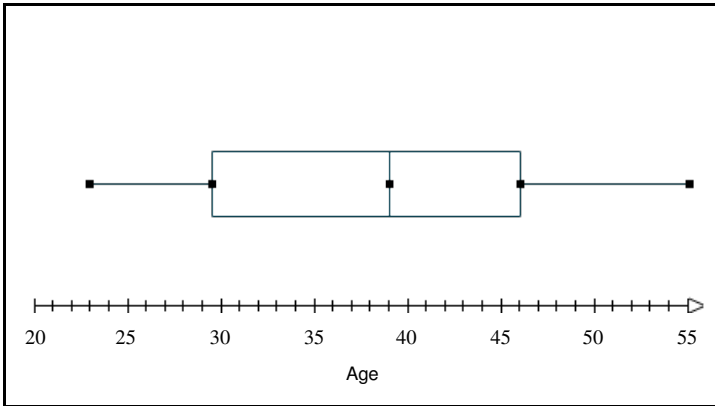
- Yes. When we make the stacks equal, the number of cubes in each stack *must* be the mean of the original stacks.
- Yes. But it didn't have to turn out that way. When the stacks are made equal, the number of cubes in each stack *may not* be the mean of the original stacks.
- No. But it didn't have to turn out that way. When the stacks are made equal, the number of cubes in each stack *may* be the mean of the original stacks.
- No. When we make the stacks equal, the number of cubes in each stack *cannot* be the mean of the original stacks.

24. Test Resolution PDF

25.



26.

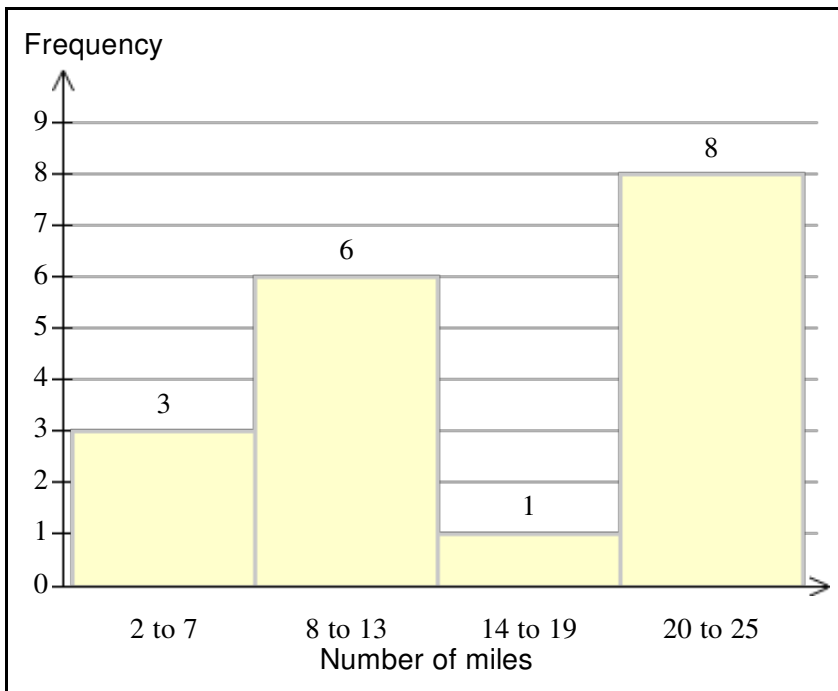


27.

(a)

Number of miles	Frequency
2 to 7	3
8 to 13	6
14 to 19	1
20 to 25	8

(b)





28.

(a) What is the sample size for Keith's sample?  8
(b) What is the sample size for Carmen's sample?  4
(c) Suppose you had to choose one sample to estimate the mean. Which sample is more likely to give a good estimate of the mean?  <input checked="" type="radio"/> Keith's sample <input type="radio"/> Carmen's sample  Why? <input type="radio"/> It has the smaller sample size. <input checked="" type="radio"/> It has the larger sample size. <input type="radio"/> It has the smaller mean. <input type="radio"/> It has the larger mean.

29.

(a) Which unit(s) could be used for the unit of measurement? Check all that apply.  <input type="checkbox"/> pounds <input checked="" type="checkbox"/> seconds <input type="checkbox"/> ounces <input checked="" type="checkbox"/> minutes <input type="checkbox"/> grams
(b) Which of the procedures below would be the best way to find the average time?  <input type="radio"/> Randomly pick 24 students to run a lap around the track and have them state their own times. <input checked="" type="radio"/> Randomly pick 24 students to run a lap around the track and measure their times. <input type="radio"/> Measure the times of 24 volunteers who run a lap around the track. <input type="radio"/> Ask for 24 volunteers to run a lap around the track and have them state their own times.

30. 1, 4

**31.**

Mode: 3

Range: 7

**32.** 9.7 pounds

**33.**

Mean of data set A: 3.5

Mean of data set B: 5

**34.** Mean: 10.2 hours

Median: 11 hours

**35. Five-number summary**

Minimum: 50

Lower quartile: 58

Median: 72

Upper quartile: 78

Maximum: 83

Interquartile range: 20

**36.** Mean absolute deviation: 3.33

**37.**  $34 \text{ m}^2$

**38.** Area = 27 square units

**39.**  $34 \text{ cm}^2$

40. Area:  $66 \text{ ft}^2$

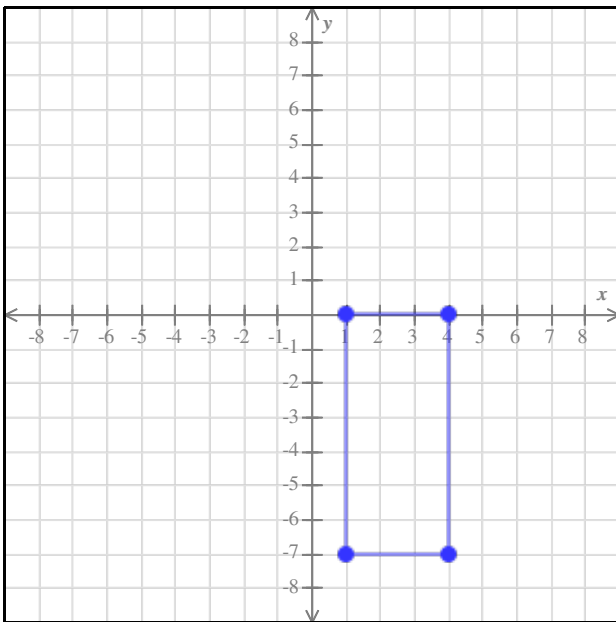
41.  $180 \text{ ft}^2$

42.  $45 \text{ ft}^2$

43. 15 square centimeters

44. 21 square meters

45.



Triangle



Rectangle



Square



None of these



46. 20 square units

47.

- (a) Use the calculator to find the surface area and volume of the box.  
Make sure to include the correct units.

$$\text{Surface area: } 124 \text{ ft}^2$$

$$\text{Volume: } 72 \text{ ft}^3$$

- (b) The box is to be filled with sand.  
Which measure would be used to find the amount of sand the box will hold?

Surface area     Volume

- (c) The box was made from wood.  
Which measure helped the carpenter know how much wood to buy?

Surface area     Volume

48.  $216 \text{ yd}^2$

49.

- (a) How many small cubes is the large solid made of? 24

- (b) What is the volume of one of the small cubes?  $\frac{1}{27} \text{ cm}^3$

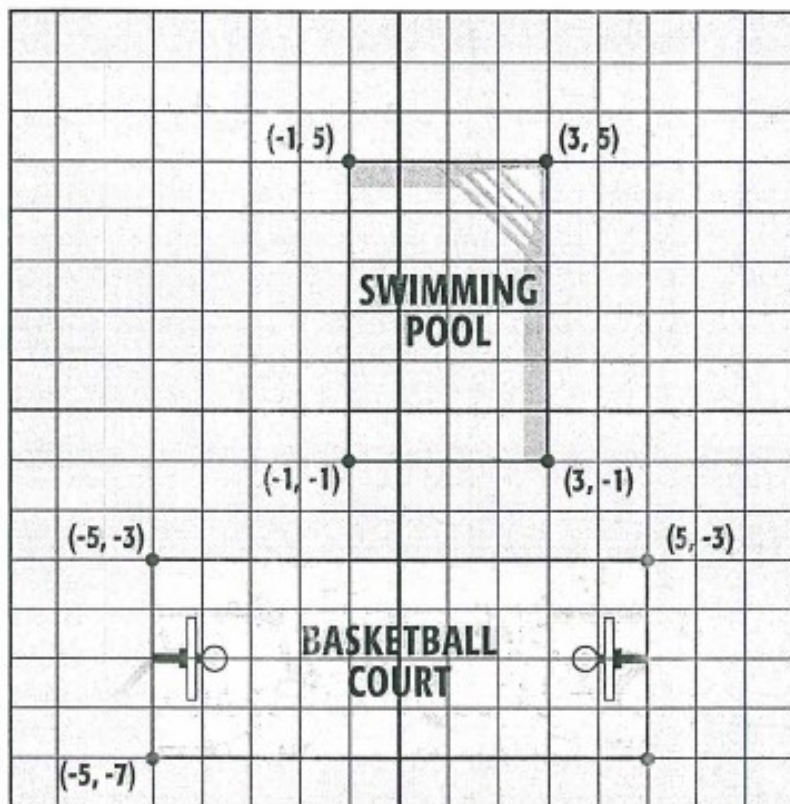
- (c) What is the volume of the large solid?  $\frac{8}{9} \text{ cm}^3$

50.  $\frac{9}{112} \text{ m}^3$

# Get Moving

You have just taken a job as a design associate with Geometric Yard Spaces, a company that uses scale drawings to plan and construct backyards. Your first assignment is to complete a project for the home of successful athlete Otis McDunk, power forward for the local professional basketball franchise. Mr. McDunk is known to be a demanding client, so your work must be of the highest quality and completely accurate!

Mr. McDunk plans to turn his backyard into an oasis for athletic activities, and he is eager to begin construction. He is relying on you to determine the quantities of materials to order. Get started by using the design draft to the right as you answer the questions below.



1 Unit = 1 Meter

## Work the Math

Record your responses on separate paper as needed.

- 1 For safety purposes, Mr. McDunk would like the outer edge of the swimming pool to be painted with a thin strip of gold reflective paint. How many meters long will the gold strip be?
- 2 Mr. McDunk's children request that the bottom of the swimming pool be lined with glow-in-the-dark tiles. How many square meters of tile will this require?
- 3 The design draft is not complete for the basketball court. What are the coordinates of the fourth corner?
- 4 Mr. McDunk asks that the basketball court be enclosed with a fence to help keep the ball inside. How many meters of fence (including the gate) will be needed?
- 5 Mr. McDunk stipulates that the basketball court's surface be made of maple wood. How many square meters of maple wood will this require?
- 6 Mr. McDunk would also like to add a small rectangular table-tennis area. Find an open place in the backyard, label the four coordinates, and find the perimeter and area of the table-tennis area.