THE NUMBER SYSTEM
CHEAT SHEET - A

Name _____

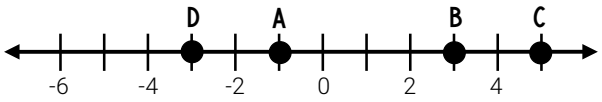
Date _____Pd_____

INTEGER VOCABULARY

NEGATIVE	ZERO	POSTITIVE
debit	neutral	increase
decrease	neutron	gain
withdrawal		rise
loss		credit
expense		deposit
below		proton
electrons		above

ABSOLUTE VALUE

The **ABSOLUTE VALUE** of a number is its **DISTANCE AWAY FROM ZERO** on the number line.



POINT	NUMBER	OPPOSITE	ABSOLUTE VALUE
A	-1	1	1
B	3	-3	3
C	5	-5	5
D	-3	3	3

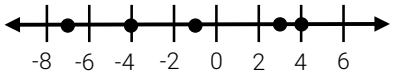
ORDERING RATIONALS & INTEGERS

PUT THE NUMBERS IN THE SAME FORM FIRST!

- For example, convert all numbers to decimals before ordering.

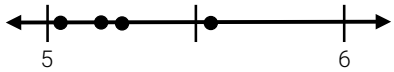
EXAMPLE 1:
Order from greatest to least

-4, 3, -1, -7, 4



EXAMPLE 2:
Order from least to greatest

5.2, $5\frac{1}{4}$, 555%, 5.07



REAL WORLD SITUATIONS

An **INEQUATLITY** can be interpreted to represent **REAL WORLD SIATIONS**.

INEQUALITY	INTERPRETATION
-6 < -2	-6 degrees is colder than -2 degrees
7 > -1	7 is located to the right of -1 on a number line
-$320 > -$500	Owing $320 is better than owing $500
-432 < 200	A town that is 432 feet below sea level is lower than a town that is 200 feet above sea level

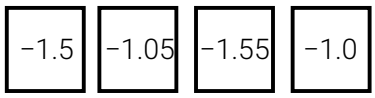
THE NUMBER SYSTEM
QUICK CHECK

Name _____

Date _____Pd_____

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓕ	Ⓖ	Ⓗ	Ⓙ

1. Meredith must order the cards from greatest to least. Which list is correct?



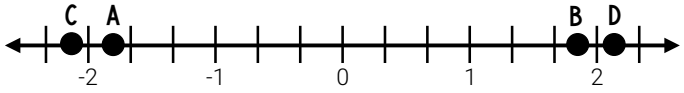
A. -1.55, -1.5, -1.05, -1.0

B. -1.0, -1.05, -1.55, -1.5

C. -1.0, -1.05, -1.5, -1.55

D. -1.5, -1.55, -1.0, -1.05

2. The following numbers are placed on a number line. Which of the following best represents point A?



F. $-2\frac{1}{8}$ **G.** $-1\frac{7}{8}$ **H.** $2\frac{1}{8}$ **J.** $1\frac{7}{8}$

3. The table below shows the number of miles run each day of the week. Which list shows the number of miles run in order from least to greatest?

MONDAY	TUESDAY	WEDNESDAY	THURSDAY
$3\frac{1}{3}$	$3\frac{2}{5}$	$3\frac{3}{8}$	$3\frac{1}{2}$

A. Monday, Thursday, Wednesday, Tuesday

B. Thursday, Tuesday, Wednesday, Monday

C. Monday, Wednesday, Tuesday, Thursday

D. Tuesday, Monday, Wednesday, Thursday

4. Jillian tracks her progress on her spelling tests over a period of four weeks. Which list shows her scores from greatest to least?

WEEK 1	WEEK 2	WEEK 3	WEEK 4
$\frac{25}{30}$	$\frac{11}{15}$	82%	0.78

F. Weeks 1, 3, 2, 4

G. Weeks 3, 1, 2, 4

H. Weeks 3, 1, 4, 2

J. Weeks 1, 3, 4, 2

5. Which of the following situations does **not** represent the number -14?

A. The temperature drops 14°F.

B. An account is credited $14.

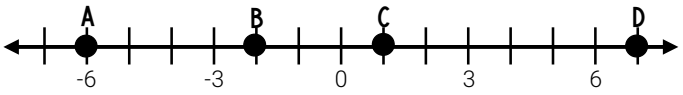
C. A football player runs for a loss of 14 yards.

D. The element Silicon has 14 electrons.

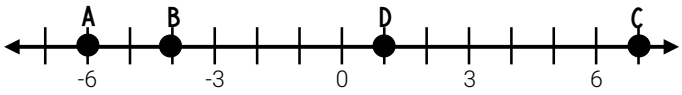
6. The following integers are placed on a number line. Which of the following best represents their location on the number line?

A. −6 B. −4 C. 7 D. −1

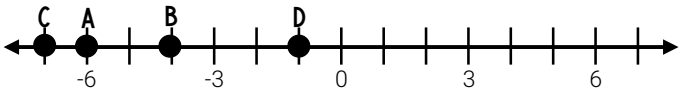
F.



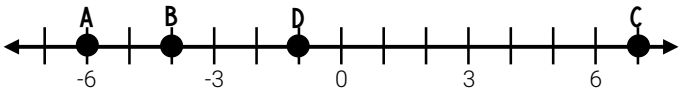
G.



H.



J.



7. Which of the following statements correctly matches its description?

A. -7 > - 9, -7 is located to the left of -9

B. -8 < -2.5, -2.5 is located to the right of -8

C. $-2\frac{2}{3} > -5$, -5 is located to the right of $-2\frac{2}{3}$

D. -10 < -9, -9 is located to the left of -10

8. Lydia owes her parents $8.50. Maria owes her parents $9.25. Which of the following inequality shows the relationship between what Lydia and Maria owe their parents?

F. -8.50 > -9.25

G. 9.25 > 8.50

H. -8.50 < -9.25

J. 9.25 < 8.50

9. The table below includes information about a number. Which of the following best represents the missing information?

NUMBER	OPPOSITE	ABSOLUTE VALUE
6	-6	?
-4	4	4
-13	13	13

A. 6

B. -6

C. 0

D. -4

10. Which of the following statements best represents the expression below?

$$-|-5|$$

F. the opposite of negative five is 5

G. the absolute value of negative 5 is 5

H. the opposite of the absolute value of negative 5 is negative 5

J. the absolute value of 5 is negative 5

RATIONAL NUMBER OPERATIONS

CHEAT SHEET - A

Name _____

Date _____ Pd _____

dividing fractions

ALGORITHM

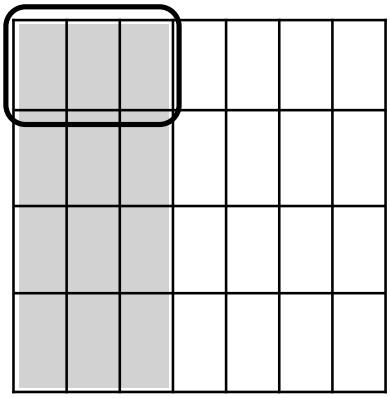
- Leave the first fraction the **SAME**
- Change the division to **MULITPLICATION**
- Find the **RECIPROCAL** of the second fraction
- **MULITPLY** the fractions
- Simplify

$$\frac{3}{7} \div \frac{4}{1}$$

$$\frac{3}{7} \cdot \frac{1}{4} = \frac{3}{28}$$

MODEL

$$\frac{3}{7} \div 4 = \frac{3}{28}$$



gcf & lcm

GREATEST COMMON FACTOR

EXAMPLE 1:
The GCF of 80 and 56

2	80	56
4	40	28
	10	7

GCF = 8

EXAMPLE 2:
The LCM of 12 and 18

12	24	36	
18	36	54	

LCM = 36

decimal operations

ADD

1. Line up the decimals
2. Include place holders
3. Add

$$\begin{array}{r} 143.90 \\ +\ 38.26 \\ \hline 182.16 \end{array}$$

SUBTRACT

1. Line up the decimals
2. Include place holders
3. Subtract

$$\begin{array}{r} 143.90 \\ -\ 38.26 \\ \hline 105.64 \end{array}$$

MULTIPLY

1. Multiply; ignore decimals
2. Count the number of digits behind the decimals; then mark that many places in the product

$$\begin{array}{r} 20.84 \\ \times\ 1.5 \\ \hline 31.260 \end{array}$$

DIVIDE

1. Remove any decimals from the divisor
2. Move the same number of places in the dividend
3. Divide and bring the decimal up into the quotient

$$2.5\overline{)150.} \quad 60$$

RATIONAL NUMBER OPERATIONS
QUICK CHECK

Name _____

Date _____Pd_____

1. Maryanne is making a friendship necklace at summer camp using 1.6 cm beads. What is a reasonable estimate for the length if she uses 24 beads?

A. 22.4 cm **B.** 40 cm **C.** 33.8 cm **D.** 38.4 cm

2. A pitcher of iced tea holds 128 ounces. A large orange cooler holds 1,792 ounces of iced tea. How many pitchers of iced tea will it take to fill the large orange cooler?

F. 12 **G.** 24 **H.** 14 **J.** 18

3. On a radio morning show, every 12th caller receives concert tickets, and every 16th caller receives an autographed album. What caller number will receive both?

A. 24 **B.** 192 **C.** 48 **D.** 84

4. Mrs. Barker displays a math problem on the white board. Which of the following expressions is also equal to the problem on the white board?

$$\frac{3}{4} \div \frac{5}{8}$$

F. $\frac{3}{4} \cdot \frac{5}{8}$ **G.** $\frac{4}{3} \cdot \frac{5}{8}$ **H.** $\frac{3}{4} \cdot \frac{8}{5}$ **J.** $\frac{4}{3} \cdot \frac{8}{5}$

5. In the month of January Sarah drove her car 3,219.2 miles. That brought the car's total mileage to 65,470.5 miles. How many miles were on the car before January?

A. 68,689.7

B. 62,251.3

C. 62,269.3

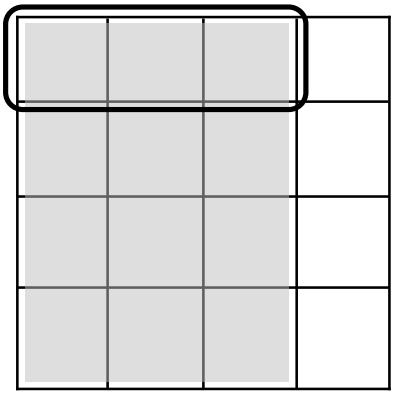
D. 57,345.8

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓕ Ⓖ Ⓗ Ⓙ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓕ Ⓖ Ⓗ Ⓙ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓕ Ⓖ Ⓗ Ⓙ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓕ Ⓖ Ⓗ Ⓙ
9. Ⓐ Ⓑ Ⓒ Ⓓ

10. Use the grid below.

					.		
⊕	⓪	⓪	⓪	⓪		⓪	⓪
⊖	①	①	①	①		①	①
	②	②	②	②		②	②
	③	③	③	③		③	③
	④	④	④	④		④	④
	⑤	⑤	⑤	⑤		⑤	⑤
	⑥	⑥	⑥	⑥		⑥	⑥
	⑦	⑦	⑦	⑦		⑦	⑦
	⑧	⑧	⑧	⑧		⑧	⑧
	⑨	⑨	⑨	⑨		⑨	⑨

6. Which of the following equations does the model below represent?



F. $\frac{3}{4} \div 4 = \frac{3}{16}$

G. $\frac{3}{4} \div \frac{1}{4} = \frac{3}{16}$

H. $\frac{2}{3} \div 4 = \frac{8}{3}$

J. $\frac{2}{3} \div \frac{1}{4} = \frac{2}{12}$

7. A local food bank is creating Thanksgiving baskets. There are 72 cans of green beans, 96 cans of corn, and 48 cans of pumpkin. What is the greatest number of baskets that can be filled equally?

A. 9
B. 15
C. 18
D. 24

8. Amanda uses $\frac{1}{3}$ of a cup of milk each time she makes a batch of pancakes. How many batches can she make if she only has $\frac{11}{12}$ of a cup of milk left?

F. $1\frac{3}{4}$

G. $2\frac{3}{4}$

H. $2\frac{1}{3}$

J. $2\frac{1}{4}$

9. Jeremy is packaging a stew into to-go containers. There are $8\frac{3}{4}$ cups of stew that need to be put into 5 to-go containers equally. How many cups of stew will be in each container?

A. $1\frac{1}{4}$
B. $1\frac{3}{4}$
C. $1\frac{2}{3}$
D. $2\frac{1}{3}$

10. The parent teacher association is raising money for a new swing set. They need $682.56 to purchase the swing set and receive a $200.00 donation. The remaining amount will be equally divided among 8 different student groups to raise. How much money will each student group need to raise in order to purchase the swing set?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

RATIOS & PROPORTIONALITY
CHEAT SHEET - A

Name _____

Date _____Pd_____

Ratios & Rates

RATIO: a comparison of **TWO** quantities

- Must be set up correctly; be sure to use labels
- Can be part-to-part or part-to-whole

$\frac{\text{3 BOYS}}{\text{4 GIRLS}}$

7 STUDENTS: 4 GIRLS

4 GIRLS TO 3 BOYS

RATE: a ratio with **TWO DIFFERENT UNITS**

$\frac{\$5.25}{6\text{ LB}}$ $\frac{250\text{ MI}}{4\text{ HRS}}$ $\frac{49\text{ FT}}{5\text{ SEC}}$

UNIT RATE: a ratio with a quantity of **ONE**

$\frac{\text{PRICE}}{1\text{ LB}}$ $\frac{\text{MILES}}{1\text{ HR}}$ $\frac{\text{FEET}}{1\text{ SEC}}$

Proportions

PROPORTION: two equal **RATIOS**

- Can be used to find a missing quantity
- Must be set up correctly; be sure to use labels
- Solve for the missing quantity
- Reread the problem to make sure you answer the question

$$\frac{\text{MILES}}{\text{HR}} = \frac{432}{6} = \frac{X}{8}$$

$$3{,}456 = 6X$$

$$576 = X$$

576 MILES IN 8 HOURS

Measurement Conversions

MEASUREMENT CONVERSION: converting units in one measurement system

INCHES TO YARDS
KILOGRAMS TO GRAMS

- Label the various units
- Use the measurement chart if necessary to find the conversion
- Set up and solve the proportion

$$\frac{\text{IN}}{\text{YDS}} = \frac{36}{1} = \frac{X}{5}$$

$$1X = 180$$

$$X = 180$$

5 YARDS = 180 INCHES

Ratio Representations

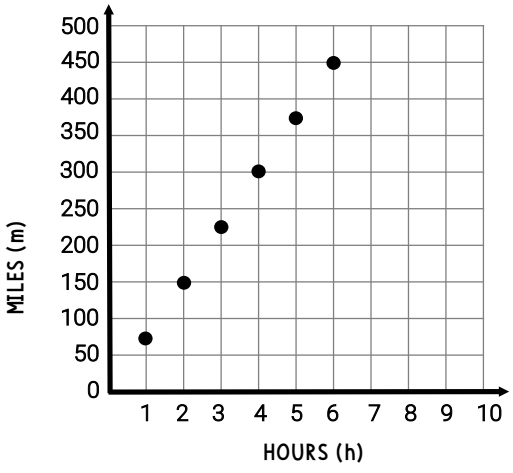
EQUATIONS

$m = 75h$

TABLES

HOURS (h)	MILES (m)
2	150
4	300
7	525
10	1500

GRAPHS



RATIOS & PROPORTIONALITY
QUICK CHECK

Name _____

Date _____Pd_____

1. A bike travels 24 miles in 3 hours. At this rate how many miles will the bike travel in 10 hours?

   A. 192
   B. 80
   C. 32
   D. 124

2. Edgar pays $67.86 for 7.8 pounds of fertilizer. What is the price per pound of fertilizer?

   F. $6.98
   G. $5.65
   H. $8.70
   J. $10.26

3. Diana uses 30 grams of coffee beans to make 48 fluid ounces of coffee. When company comes she makes 96 fluid ounces of coffee. How many grams of coffee beans does Diana use when company comes?

   A. 160 B. 60 C. 98.2 D. 14.4

4. Sarah Beth babysits and earns $10.50 per hour. Which of the following best represents the relationship between the number of hours, *h*, and the total earnings, *t*.

   F. t = 10.50 + *h*
   G. t = 10.50*h*
   H. h = 10.50 + *t*
   J. h = 10.50*t*

5. The model below shows the ratio of gray to white squares. Which of the following is **not** an equivalent ratio of gray squares to total squares?

   A. 9/24
   B. 21/60
   C. 15/40
   D. 27/72

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓕ Ⓖ Ⓗ Ⓙ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓕ Ⓖ Ⓗ Ⓙ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓕ Ⓖ Ⓗ Ⓙ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓕ Ⓖ Ⓗ Ⓙ
9. Ⓐ Ⓑ Ⓒ Ⓓ
10. Use the grid below.

					.		
⊕	⓪	⓪	⓪	⓪		⓪	⓪
⊖	①	①	①	①		①	①
	②	②	②	②		②	②
	③	③	③	③		③	③
	④	④	④	④		④	④
	⑤	⑤	⑤	⑤		⑤	⑤
	⑥	⑥	⑥	⑥		⑥	⑥
	⑦	⑦	⑦	⑦		⑦	⑦
	⑧	⑧	⑧	⑧		⑧	⑧
	⑨	⑨	⑨	⑨		⑨	⑨

6. Isabella decides to sell handmade stationery. She decides to sell 2 cards for $9. Which table below show the possible values of *c*, the number of cards Isabella sells, and *d*, the number of dollars she charges?

F.

CARDS, c	2	9	11	15
DOLLARS, d	9	40.5	50.5	67.5

G.

CARDS, c	9	18	27	36
DOLLARS, d	2	4	6	8

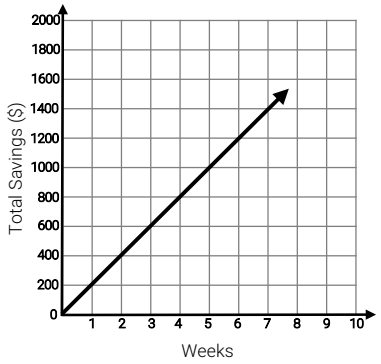
H.

CARDS, c	2	4	7	10
DOLLARS, d	9	18	31.5	45

J.

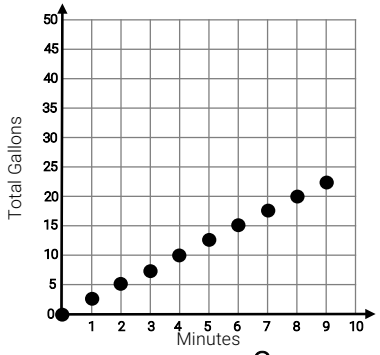
CARDS, c	2	3	4	5
DOLLARS, d	9	10	11	12

7. The graph shows the amount of money that Janice saves each week from her summer job. Which equation best represents the graph?



A. y = 200x
B. y = x + 200
C. x = 200y
D. x = y + 200

8. Which of the following tables best represents the ratio of minutes it takes to fill a bathtub to the total number of gallons?



F.

Minutes	Gallons
2	5
5	15
8	20
12	25

G.

Gallons	Minutes
2.5	1
5	2
7.5	3
9	4

H.

Gallons	Minutes
5	2
10	5
15	3
20	4

J.

Minutes	Gallons
2	5
5	12.5
7	17.5
11	27.5

9. Miguel weighs himself and discovers he weighs 83,600 grams. How many kilograms does Miguel weigh?

A. 8.36 kg

B. 83.6 kg

C. 8,360 kg

D. 83,600,00 kg

10. Jameson pays $39.90 for 3.8 pounds of almonds. What is the price per pound of almonds? Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

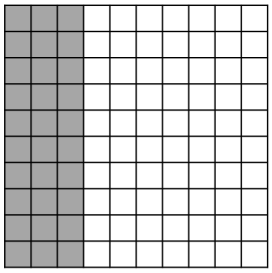
PERCENTS
CHEAT SHEET - A

Name _____

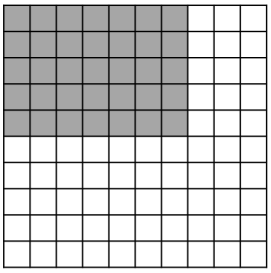
Date _____Pd_____

PERCENT MODELS

PERCENT = OUT OF 100



30%



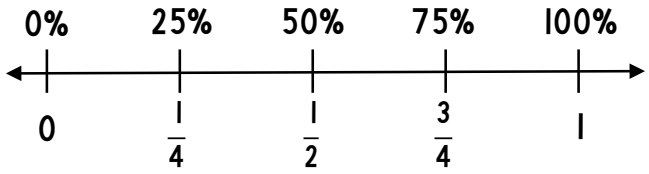
35%

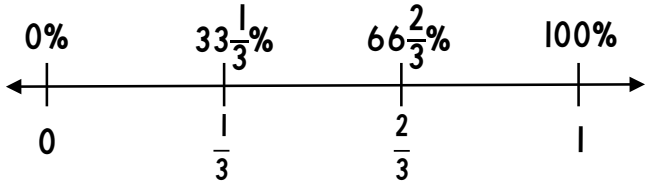
100%

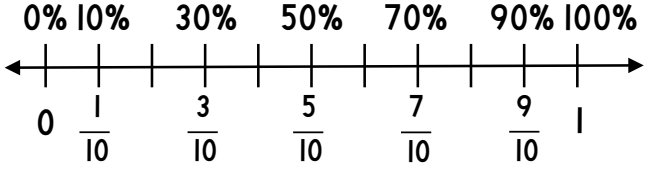
50%

$66\frac{2}{3}\%$

BENCHMARK PERCENTS







PERCENT PROPORTIONS

- Can be used to find a missing quantity
- Must be set up correctly; be sure to use labels

$$\frac{\%}{100} = \frac{\text{PART}}{\text{WHOLE}}$$

PERCENT: a **QUANTITY** out of **100**

- Set up a percent proportion
- Solve for the missing quantity
- Reread the problem to make sure you answer the question

EXAMPLE 1:

Seventy-two percent of students buy their lunch at school. If there are 300 students at school, then how many buy their lunch?

$$\frac{72}{100} = \frac{X}{300}$$

$$100X = 21600$$

$$X = 216$$

216 STUDENTS

EXAMPLE 2:

Sixty-four students buy their lunch at school. This is 16% of the total student body. How many students are in the school?

$$\frac{16}{100} = \frac{64}{X}$$

$$16X = 6400$$

$$X = 400$$

400 STUDENTS

PERCENT

PERCENTS
QUICK CHECK

Name _____

Date _____Pd_____

1. There are 200 end-of-the-year school dance tickets available. Students who have perfect attendance are able to purchase them in advance. If 18 tickets were purchased in advance, then what percent of the tickets were purchased in advance?

A. 18%
B. 22%
C. 9%
D. 14%

2. A survey shows that 85% of students carry a backpack to school. If there are 320 students in the school, then how many students carry a backpack?

F. 302
G. 220
H. 190
J. 272

3. A flock of sheep has 182 white sheep and 98 spotted sheep. Which proportion can be used to determine *p*, the percent of the flock that has spots?

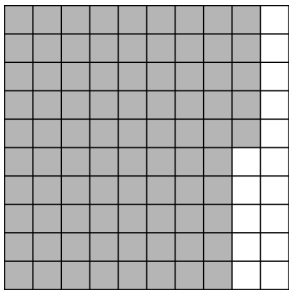
A. $\frac{p}{100} = \frac{98}{182}$ B. $\frac{p}{100} = \frac{182}{280}$ C. $\frac{280}{182} = \frac{98}{p}$ D. $\frac{98}{280} = \frac{p}{100}$

4. Eighty percent is best represented by which the following fractions?

F. $\frac{8}{100}$ G. $\frac{4}{5}$

H. $\frac{3}{4}$ J. $\frac{8}{20}$

5. What number does the model below best represent?



A. 17/20 C. 0.80

B. 75% D. 16/20

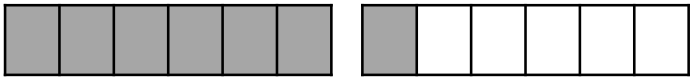
1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓕ Ⓖ Ⓗ Ⓙ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓕ Ⓖ Ⓗ Ⓙ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓕ Ⓖ Ⓗ Ⓙ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓕ Ⓖ Ⓗ Ⓙ
9. Ⓐ Ⓑ Ⓒ Ⓓ
10. Use the grid below.

					.		
⊕	⓪	⓪	⓪	⓪		⓪	⓪
⊖	①	①	①	①		①	①
	②	②	②	②		②	②
	③	③	③	③		③	③
	④	④	④	④		④	④
	⑤	⑤	⑤	⑤		⑤	⑤
	⑥	⑥	⑥	⑥		⑥	⑥
	⑦	⑦	⑦	⑦		⑦	⑦
	⑧	⑧	⑧	⑧		⑧	⑧
	⑨	⑨	⑨	⑨		⑨	⑨

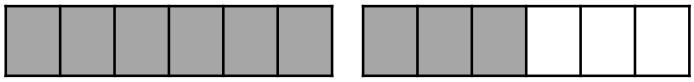
6. Mr. Dorado has completed 75% of his morning run. Which of the following sets does **not** represent 75%?

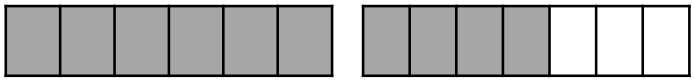
F. $\frac{3}{4}$, 0.75 G. .75, $\frac{15}{20}$ H. 7.5, $\frac{9}{12}$ J. $\frac{75}{100}$, $\frac{9}{12}$

7. If the shaded strip diagram represents 100%, then which strip diagram represents 150%?

A. 

B. 

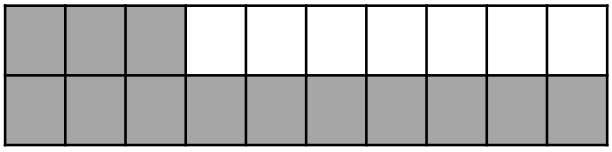
C. 

D. 

8. On a spelling test, Marcy got 15% of the questions incorrect. If there were 40 questions on the spelling test, then how many questions did Marcy get correct?

F. 6 G. 12 H. 15 J. 34

9. The shaded area below represents the pieces of tile installed in a hallway. What percent of the hallway has **not** been installed with tile?



A. 65%

B. 35%

C. 66.6%

D. 33.3%

10. Paula earned a 56% on her science test. If she got 14 problems correct, then how many questions were on the test?

ALGEBRAIC REPRESENTATIONS
CHEAT SHEET - A

Name _____

Date _____Pd_____

algebraic representations

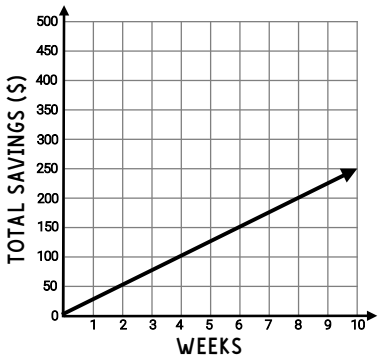
- An equation, table, graph, or verbal description can describe the relationship between x and y.

MULTIPLICATIVE RELATIONSHIPS

$y = ax$

a = the change in the relationship

X	Y
0	0
1	25
2	50
3	75
4	100

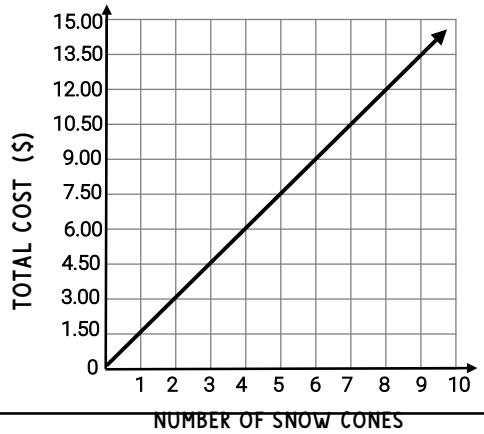


- PASSES THROUGH THE ORIGIN (0, 0)
- FORMS A STRAIGHT LINE

Independent & dependent quantities

INDEPENDENT QUANTITIES:
- the x-values in a relationship
- constant
- measured

DEPENDENT QUANTITIES:
- the y-values in a relationship
- varies
- depends on x

EQUATION	GRAPH	TABLE
$c = 1.50s$		IND → S, DEP → C
DESCRIPTION		
The cost of a snow cone is $1.50. What is the total cost, c, of s, number of snow cones?		

S	C
0	0
1	1.50
2	3.00
3	4.50
4	6.00

ALGEBRAIC REPRESENTATIONS
QUICK CHECK

Name _____

Date _____Pd_____

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓕ	Ⓖ	Ⓗ	Ⓙ

1. Burger Town sells cheeseburgers for $7.95 per cheeseburger, *c*. Which of the following equations best represents the total cost, *t*, of a cheeseburger?

A. t = 7.95*c*

B. t = 8.95*c*

C. t = 7.95*c* + 1.00

D. t = 7.95 + 1.00*c*

2. A standard bathtub fills at a rate of y = 12x. Which of the following tables bests represents the equation?

F.

X	1	2	4	5
Y	0	12	24	36

G.

X	1	3	4	5
Y	12	24	36	48

H.

X	0	2	4	5
Y	0	24	48	72

J.

X	1	2	3	4
Y	12	24	36	48

3. The table shows the relationship between the distance away from the airport and the cost of a taxi ride to the airport. Which equation best represents the relationship in the table?

NUMBER OF MILES (d)	5	10	15	20	25
TOTAL COST (c)	$12.50	$25.00	$37.50	$50.00	$62.50

A. c = 2.5d

B. d = 2.5c

C. $c = \frac{d}{2.5}$

D. $d = \frac{c}{2.5}$

4. The table below shows the relationship between the number of miles traveled and the number of gallons of gas used. Which of the following statements best represents the relationship?

NUMBER OF MILES	35	70	105	140	175
NUMBER OF GALLONS	1	2	3	4	5

F. The number of miles is the dependent quantity and the number of gallons is the independent quantity.

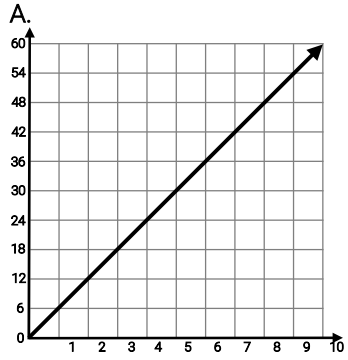
G. The number of miles and the number of gallons are both dependent quantities.

H. The number of gallons and the number of miles are both independent quantities.

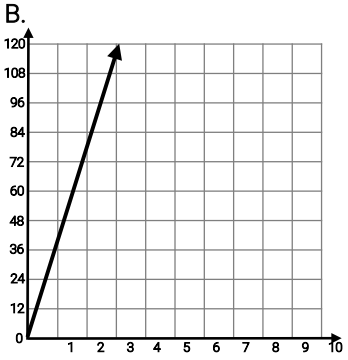
J. The number of miles is the independent quantity and the number of gallons is the dependent quantity.

5. The total number of eggs, y, contained in x cartons can be represented by the equation y = 12x. Which of the following graphs best represents this situation?

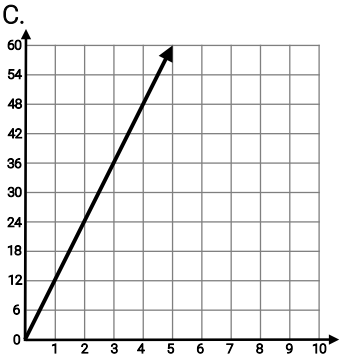
A.



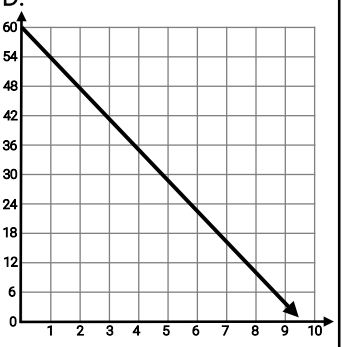
B.



C.



D.



6. The table below shows the relationship between the number of bridesmaid bouquets and the number of flowers. Which equation best represents the relationship?

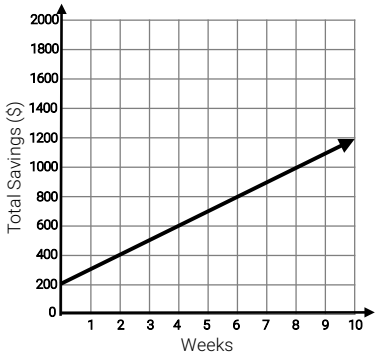
F. b = 15f
G. f = 15b
H. f = b + 15
J. f = 15 – b

NUMBER OF BOUQUETS (B)	NUMBER OF FLOWERS (F)
2	30
3	45
7	105

7. Marcy will earn 3 reward points for each movie she attends. Which equation represents the relationship between y, the total points, and x the number of movies?

A. y = 3x
B. y = -3x
C. x = 3y
D. x = -3y

8. The graph shows the amount of money that Janice saves each week from her summer job. Which best represents the dependent variable?



F. the number of weeks
G. the amount earned each week
H. the total savings in dollars
J. the number of hours worked each week

9. Two equations are shown below. Which of the statements best explains the relationship between the equations?

$$y = 3x$$
$$y = x + 3$$

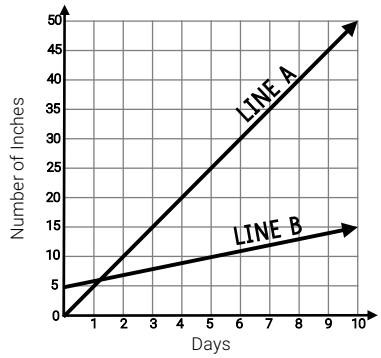
A. In y = x + 3, the value of y is 3 more than the value of y = 3x.

B. In y = 3x, the value of y is 3 times the value of y in the equation y = x + 3

C. In y = 3x, the value of y is three times the value of x, and in y = x + 3 the value of y is three less the value of x.

D. In y = 3x, the value of y is three times the value of x, and in y = x + 3, the value of y is three more than the value of x.

10. Line A represents the equation y = 5x. Line B represents the equation y = x + 5. Which statement best describes the relationship between line A and line B?



F. Line A will always be greater than line B.

G. Line A and line B start at the same point.

H. Line A increases more rapidly than line B.

J. Line B increases more rapidly than line A.

EXPRESSIONS
CHEAT SHEET - A

Name _____

Date _____Pd_____

PROPERTIES OF OPERATIONS

PROPERTIES OF OPERATIONS RESULT IN EQUIVALENT EXPRESSIONS

ORIGINAL EXPRESSION	PROPERTY	EQUIVALENT EXPRESSION
$8 + 0$	IDENTITY	8
$6 \cdot 3 \cdot 2$	COMMUTATIVE	$3 \cdot 2 \cdot 6$
$6 + (3 + 2)$	ASSOCIATIVE	$(6 + 3) + 2$
$8(x + 7)$	DISTRIBUTIVE	$8x + 56$

The **RECIPROCAL** of a number results in a **PRODUCT OF 1**.

FLIP

$$\frac{5}{6} \cdot \frac{6}{5} = 1$$

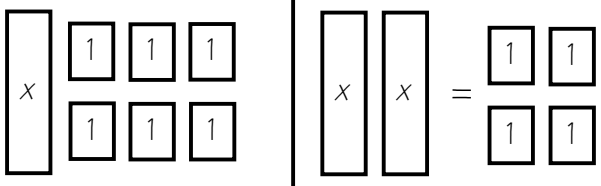
VOCABULARY

$$4x + 7^2 - 10$$

TERM	$4x$, 7^2, 10
VARIABLE	x
COEFFICIENT	4
EXPONENT	2
CONSTANT	10
OPERATION	$+$, $-$

EXPRESSIONS

EXPRESSION	EQUATION
the difference between a number and 12	the difference between a number and 12 is 9
$x - 12$	$x - 12 = 9$
$4 + 13$	$4 + 13 = 17$



ORDER OF OPERATIONS

PEMDAS

EXAMPLE 1:

$6^2 - 9 \div 3 \cdot 4$

$36 - 9 \div 3 \cdot 4$

$36 - 3 \cdot 4$

$36 - 12$

24

EXAMPLE 2:

$14 + 6(8 \div 2) - 5$

$14 + 6 \cdot 4 - 5$

$14 + 24 - 5$

$38 - 5$

33

EXPRESSIONS
QUICK CHECK

Name _____

Date _____Pd_____

1. Which expression is equivalent to 4(2x +3)?

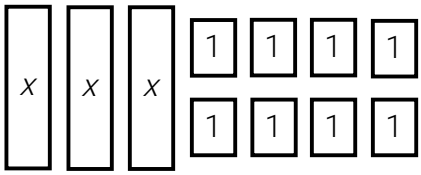
A. 4 + 2x + 4 +3 B. 8x + 12 C. 8x + 3 D. 4 + 2x + 12

2. Amanda simplifies the following expression and shows her work below. What mistake did Amanda make that resulted in an incorrect answer?

$$34 - 8 \div 2 + 3 \cdot 4$$
$$34 - 4 + 3 \cdot 4$$
$$34 - 7 \cdot 4$$
$$34 - 28$$
$$6$$

F. she added before multiplying
G. she subtracted before adding
H. she multiplied before dividing
J. she added before dividing

3. Which of the following expressions is best represented by the model below?



A. 3x + 10
C. 3x + 6
B. 3x - 2
D. 3x + 8

4. Four students write algebraic expressions and equations on their white board. Which of the students wrote expressions?

STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4
$\frac{1}{2}x+6$	$3x=\frac{2}{3}$	$4-\frac{3}{4}=x$	$5-x$

F. Students 1 and 4
G. Students 2 and 3
H. Students 1, 3, and 4
J. Students 2 and 4

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓕ Ⓖ Ⓗ Ⓙ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓕ Ⓖ Ⓗ Ⓙ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓕ Ⓖ Ⓗ Ⓙ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓕ Ⓖ Ⓗ Ⓙ
9. Ⓐ Ⓑ Ⓒ Ⓓ
10. Use the grid below.

					.		
⊕	⓪	⓪	⓪	⓪		⓪	⓪
⊖	①	①	①	①		①	①
	②	②	②	②		②	②
	③	③	③	③		③	③
	④	④	④	④		④	④
	⑤	⑤	⑤	⑤		⑤	⑤
	⑥	⑥	⑥	⑥		⑥	⑥
	⑦	⑦	⑦	⑦		⑦	⑦
	⑧	⑧	⑧	⑧		⑧	⑧
	⑨	⑨	⑨	⑨		⑨	⑨

5. Which two expressions are equivalent?

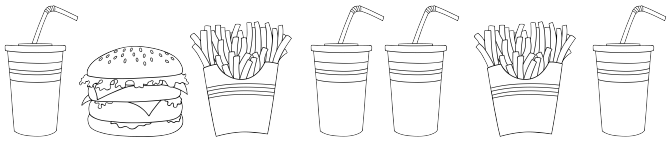
A. $4(2 + x)$
$4 \cdot 2 + 2 \cdot x$

B. $4 + 2 + x$
$(4 + 2) + x$

C. $4 \cdot x + 2$
$4 \cdot (x + 2)$

D. $4 \div (2 - x)$
$4 - 2 \div x$

6. Sara and her friends go to a football game and get snacks from the concessions. She uses various pictures to show what they ordered. Which of the following expressions best represents their order?



F. $4d + h + 2f$

G. $4d + 2h + 2f$

H. $h + 2f + 5d$

J. $2h + 4f + 3d$

7. Which of the following best represents a term in the expression below?

$$6x + 5^3 - 7y + 20$$

A. 7

B. 6

C. 5^3

D. y

8. The expression below is evaluated when x = 9, y = 3, and z = 2. What is the value of the expression?

$$8x - z^2 + 2y$$

F. 38

G. 16

H. 72

J. 74

9. Which of the set of expressions is equivalent?

A. $3(2x + 5)$ and $6x + 5$

B. $2(3x + 5)$ and $6x + 15$

C. $3(2x + 5)$ and $6x + 10$

D. $2(3x + 5)$ and $6x + 10$

10. Determine the value of the expression below.

$$9 + 3(10 \div 2) + 5^2$$

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

EQUATIONS AND INEQUALITIES
CHEAT SHEET - A

Name _____

Date _____Pd_____

SOLVING EQUATIONS

Use **INVERSE OPERATIONS** to **UNDO** the equation.

- undo addition or subtraction
- undo multiplication or division
- isolate the variable
- check your work

$$\frac{6x}{6}=\frac{36}{6}$$

$$x=6$$

$$6(6)=36$$

GRAPHING INEQUALITIES

GRAPH the inequality statement on a number line to represent **THE POSSIBLE SOLUTIONS**.

● **VALUE IS INCLUDED**

○ **VALUE IS NOT INCLUDED**

INEQUALITIES

SAME STEPS as **SOLVING EQUATIONS!**

- To check your work, choose a value that is within the constraints of the inequality and plug in the number.
- If it is correct, then you should get a true statement.

	CHECK ✓
$2x > 20$	$2(11) > 20$
$x > 10$	$22 > 20$

INEQUALITY VOCABULARY

- Remember that each term can represent a different inequality symbol when writing inequalities.

<	≤	≥	>	=
• less than • is fewer than • is smaller than • below	• less than or equal to • maximum • at most • is not more than • is not greater than	• greater than or equal to • minimum • at least • is not less than • is not smaller than	• greater than • is more than • is larger than • above	• equal • is • same

WRITING EQUATIONS & INEQUALITIES

- Determine what is being solved for and choose a variable (number of rides, number of feet, etc).
- Determine the result of the situation (total cost, total height, difference in weight, etc).

$3 per person	=	total cost
3x		75

15 miles	+	x miles	=	total distance
15		x		24

- If it is not equal, then use the appropriate inequality symbol.

EQUATIONS AND INEQUALITIES
QUICK CHECK

Name _____

Date _____Pd_____

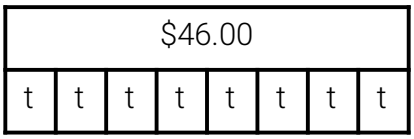
1. Ms. Sung budgets a maximum of $320 per month for groceries. She grocery shops 4 times a month. Which inequality can be used to find the possible values of x, the amount she can spend at the grocery store during each shopping trip?

A. $4 + x < 320$ **B.** $4x \leq 320$ **C.** $4x \geq 320$ **D.** $4 + x > 320$

2. If x = 5, then which inequality is true?

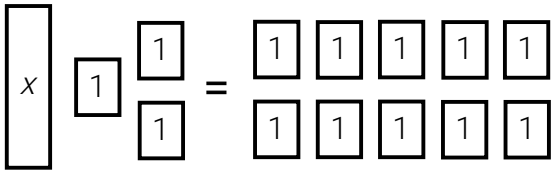
F. $2x \geq 12$ **G.** $x - 2 < 7$ **H.** $2x > 12$ **J.** $x - 7 > 2$

3. The entrance fee to the children's museum was a total of $46.00 for eight tickets. The model below shows the relationship. What was the entrance fee for one ticket?



A. $5.75 **B.** $5.25 **C.** $6.25 **D.** $7.00

4. An equation is modeled below using algebra tiles. Which value of x makes the equation true?



F. x = 7 **G.** x = 13

H. x = -7 **J.** x = -13

5. Margo must sell at least 38 tubs of cookie dough to support the student council fundraiser. She has already sold 19 tubs of cookie dough. Which inequality best represents the number of tubs of cookie dough Margo still needs to sell?

A. $x + 19 > 38$ **B.** $x + 19 \leq 38$

C. $x + 19 < 38$ **D.** $x + 19 \geq 38$

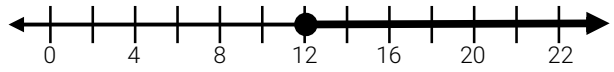
1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓕ Ⓖ Ⓗ Ⓙ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓕ Ⓖ Ⓗ Ⓙ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓕ Ⓖ Ⓗ Ⓙ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓕ Ⓖ Ⓗ Ⓙ
9. Ⓐ Ⓑ Ⓒ Ⓓ

10. Use the grid below.

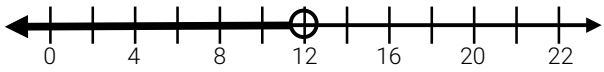
					.		
⊕	⓪	⓪	⓪	⓪		⓪	⓪
⊖	①	①	①	①		①	①
	②	②	②	②		②	②
	③	③	③	③		③	③
	④	④	④	④		④	④
	⑤	⑤	⑤	⑤		⑤	⑤
	⑥	⑥	⑥	⑥		⑥	⑥
	⑦	⑦	⑦	⑦		⑦	⑦
	⑧	⑧	⑧	⑧		⑧	⑧
	⑨	⑨	⑨	⑨		⑨	⑨

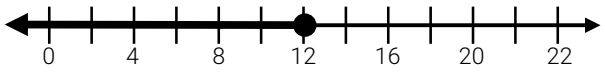
6. An elevator has a maximum weight of 300 pounds. Each pallet of boxes weighs 25 pounds. Which of the following number lines best represents the solution to the inequality?

$$25x \leq 300$$

F.


G.


H.


J.


7. Which situation best represents the equation below?

$$x - 15 = 60$$

A. Sandy collects sea shells. She had 60 shells, but then she gave away 15 shells. How many shells does Sandy have in her collection?

B. Mr. Yung is 15 years younger than his brother. His brother is 60 years old. How old is Mr. Yung?

C. The school band is selling raffle tickets. They have already sold 15 tickets and have 60 remaining. How many raffle tickets did the school band begin with?

D. Daniella measures a 15 inch length of rope and attaches it to another length of rope. Together the two ropes are 60 inches in length. How long was the piece of rope that Daniella attached?

8. The number line below represents the solution to which inequality?

F. $x + 8 \geq 15$

G. $x + 8 \leq 15$

H. $x - 8 \leq 15$

J. $x - 8 \geq 15$

9. Two piggy banks have a sum of $36.50. The first piggy bank has $13.75. How much does the second piggy bank have in it?

A. $22.75

B. $50.25

C. $2.65

D. $501.88

10. What is the value of x in this equation?

$$8x = 66$$

Use the bubbles in the answer section to mark your answer.

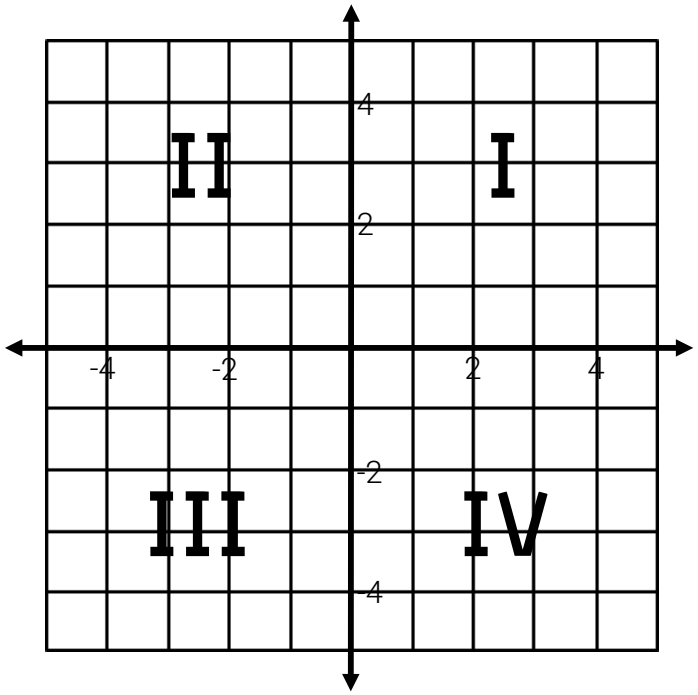
THE COORDINATE PLANE
CHEAT SHEET - A

Name _____

Date _____Pd_____

the coordinate plane

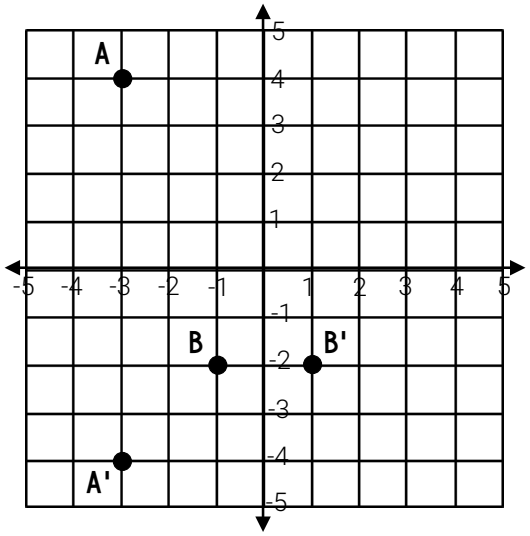
(X, Y)



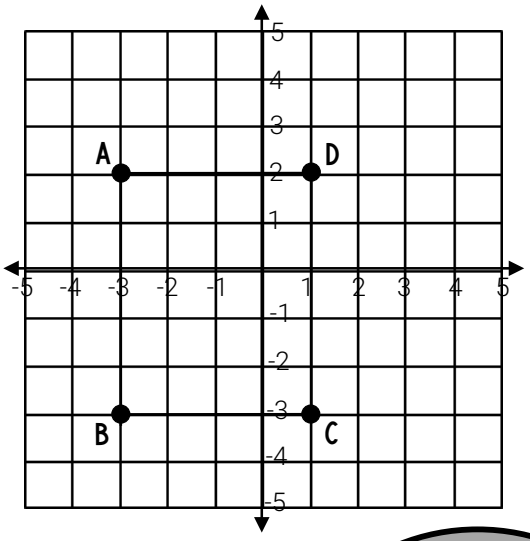
- Begin at the origin
- Locate the x-coordinate by moving horizontally
- Then, locate the y-coordinate by moving vertically

Reflections

A is reflected across the **X-AXIS** to **A'**
B is reflected across the **Y-AXIS** to **B'**



A: (-3, 2) **B: (-3, -3)**
C: (I, -3) **D: (I, 2)**



POLYGONS

THE COORDINATE PLANE
QUICK CHECK

Name _____

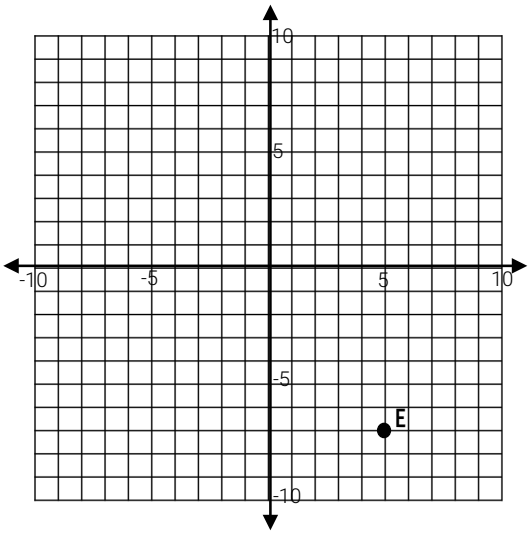
Date _____Pd_____

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓕ	Ⓖ	Ⓗ	Ⓙ

1. The ordered pair (-7, 9) can be found in which quadrant?

A. Quadrant I **B.** Quadrant II **C.** Quadrant III **D.** Quadrant IV

2. Point E is reflected across the y-axis. Which ordered pair best represents E'?



F. (5, -7)

G. (-7, 5)

H. (-5, -7)

J. (5, 7)

3. Jeremy plots the points (4, 3) and (4, -6) on the coordinate plane. Which of the following statements best describes the points he plotted?

A. the points form a vertical line segment that measures 9 units
B. the points form a horizontal line segment that measures 7 units
C. the points form a vertical line segment that measures 7 units
D. the points form a horizontal line segment that measures 9 units

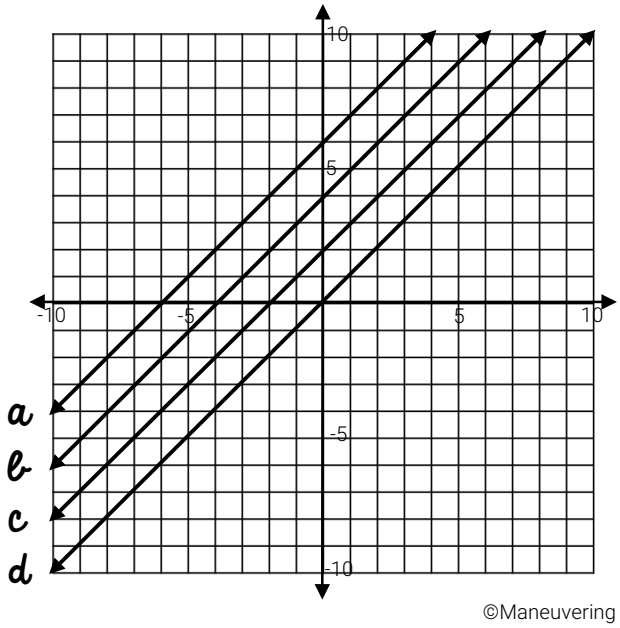
4. Which line contains the ordered pair (-2, 4)?

F. line A

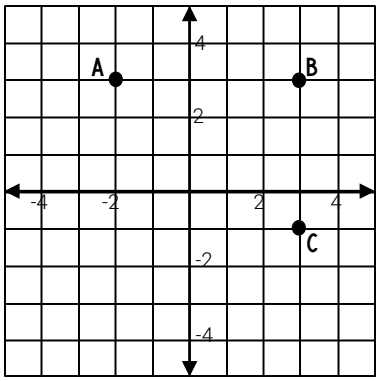
G. line B

H. line C

J. line D

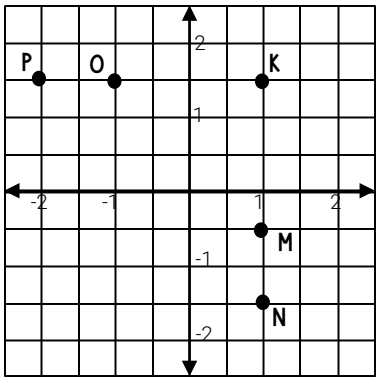


5. The points on the coordinate plane are three vertices of rectangle ABCD. What is the ordered pair of D?



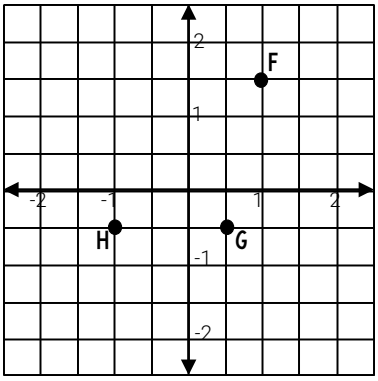
A. (-2, 1) B. (-1, 2) C. (1, -2) D. (-2, -1)

6. Point K is reflected across the x-axis. Which of the following points best represents K'?



F. point M G. point N H. point O J. point P

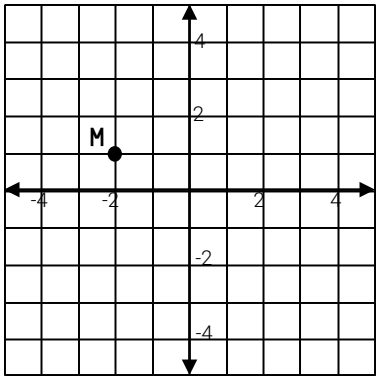
7. Three points form a triangle and are graphed on the coordinate plane. Which of the ordered pairs below represents a point on the triangle?



A. (-1, -0.5) B. (2, 3)

C. (1, -1.5) D. (-1, -1)

8. Marsha's house is located on the coordinate plane below. Tasha's house is located 6 units from Marsha's house. Which of the following could represent the location of Tasha's house?



F. (-2, 5) G. (4, 2)

H. (2, 5) J. (-2, -5)

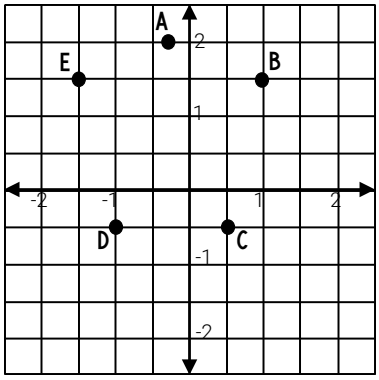
9. The table below includes information about the vertices of a triangle. Which of the following best represents the missing information?

VERTEX	REFLECTED ACROSS X-AXIS	REFLECTED ACROSS Y-AXIS
(0, 0)	(0, 0)	(0, 0)
(4, 5)	(4, -5)	(-4, 5)
(3, -2)	?	(-3, -2)

A. (3, 2) B. (3, -2)

C. (-3, 2) D. (-3, -2)

10. Points A, B, C, D, and E form a pentagon. Which of the following ordered pairs can be located inside the pentagon?



F. (-1, -1) G. (1, -1)

H. (1, 2) J. (-0.5, 1)

GEOMETRY AND MEASUREMENT
CHEAT SHEET - A

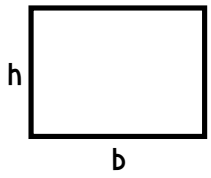
Name _____

Date _____Pd_____

QUADRILATERALS (UNITS²)

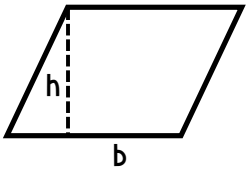
RECTANGLE

$A = b \cdot h$



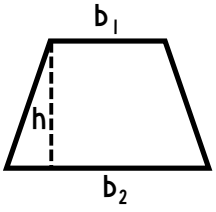
PARALLELOGRAM

$A = b \cdot h$



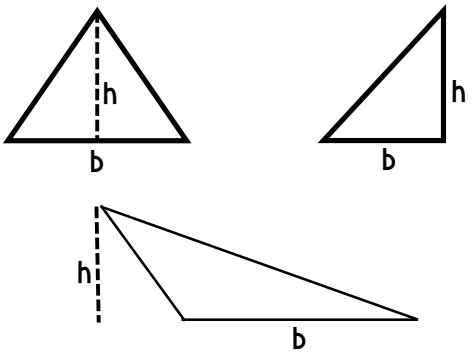
TRAPEZOID

$A = \frac{1}{2}(b_1 + b_2)h$



TRIANGLES (UNITS²)

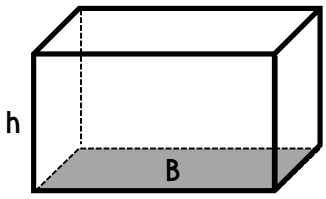
TRIANGLE $A = \frac{b \cdot h}{2}$

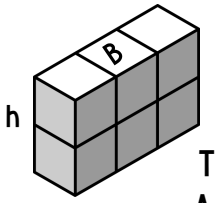


A **TRIANGLE** is decomposed from a rectangle that is cut in half diagonally.

VOLUME

- Find the area of the base (B).
- Multiply the area of the base (B) times the height of the prism.





(UNITS³)

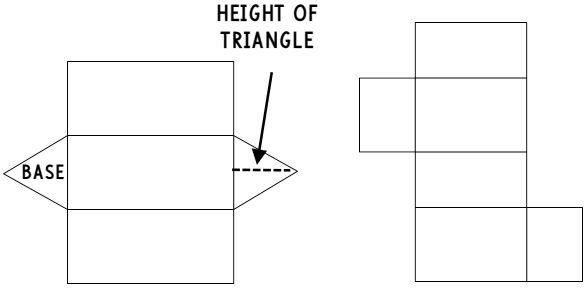
THE AMOUNT OF SPACE A 3D OBJECT OCCUPIES

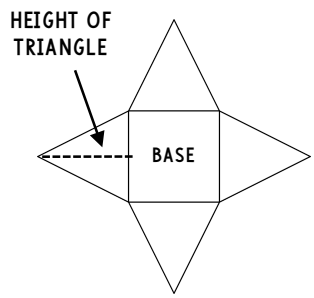
SURFACE AREA

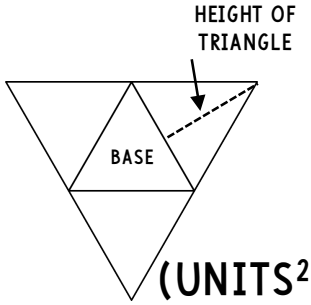
THE TOTAL COVERING ON THE FACES OF A 3D OBJECT

EX: WRAPPING A PRESENT, A CARDBOARD NET, PAINTING THE SIDES OF A 3D FIGURE

- Find the area of the various faces and add them together.







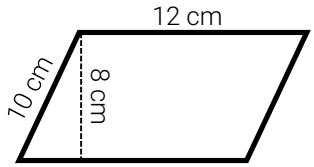
(UNITS²)

GEOMETRY AND MEASUREMENT
QUICK CHECK

Name _____

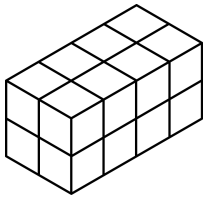
Date _____Pd_____

1. A parallelogram is shown below. Which equation best represents the formula for the area of the parallelogram?



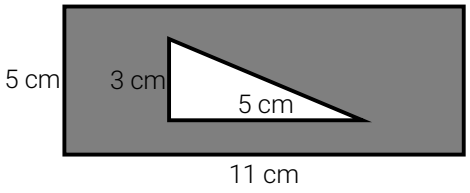
A. $A= \frac{1}{2}(8+12)\cdot 10$ B. $A= \frac{1}{2}(10+12)\cdot 8$ C. $A= 12\cdot 8$ D. $A= 12\cdot 10$

2. The rectangular prism below is filled with cubic units. Each unit measures $\frac{1}{3}in^3$. How many unit cubes does it take to fill the rectangular prism?



F. 32 G. 16 H. 8 J. 4

3. A triangle is inscribed in a rectangle, as shown below. What is the area of the shaded region?



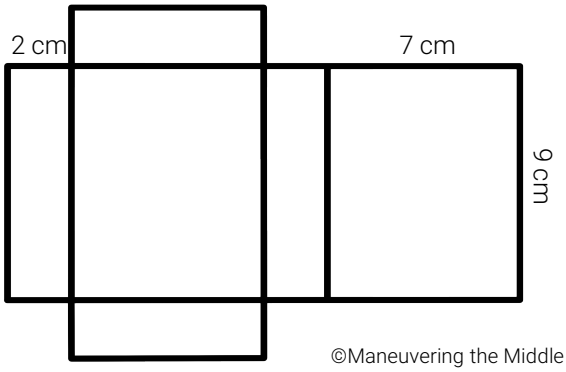
A. 40 cm^2

B. 62.5 cm^2

C. 47.5 cm^2

D. 22.75 cm^2

4. The dimensions of the rectangular prism are shown on the net below. Which of the following is closest to the total surface area of the figure?



F. 85 cm^2

G. 126 cm^2

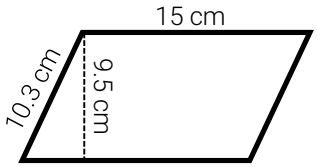
H. 63 cm^2

J. 190 cm^2

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓕ Ⓖ Ⓗ Ⓙ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓕ Ⓖ Ⓗ Ⓙ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓕ Ⓖ Ⓗ Ⓙ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓕ Ⓖ Ⓗ Ⓙ
9. Ⓐ Ⓑ Ⓒ Ⓓ
10. Use the grid below.

					.		
⊕	⓪	⓪	⓪	⓪		⓪	⓪
⊖	①	①	①	①		①	①
	②	②	②	②		②	②
	③	③	③	③		③	③
	④	④	④	④		④	④
	⑤	⑤	⑤	⑤		⑤	⑤
	⑥	⑥	⑥	⑥		⑥	⑥
	⑦	⑦	⑦	⑦		⑦	⑦
	⑧	⑧	⑧	⑧		⑧	⑧
	⑨	⑨	⑨	⑨		⑨	⑨

5. What is the area of the figure below?



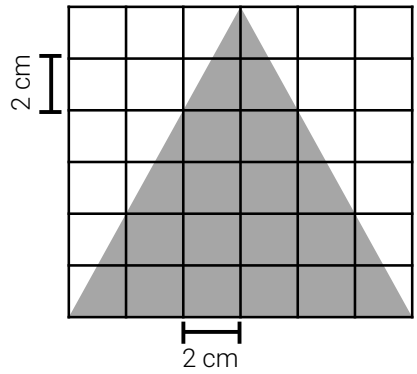
A. 142.5 cm^2

B. 154.5 cm^2

C. 97.85 cm^2

D. 210 cm^2

6. A puzzle is shown below. Which of the following is the closest to the area of the shaded portions of the puzzle?



F. 18 cm^2

G. 36 cm^2

H. 72 cm^2

J. 144 cm^2

7. A clothing trunk measures 2.5 feet wide by 1.5 feet high by 4 feet long. What is the volume of the clothing trunk?

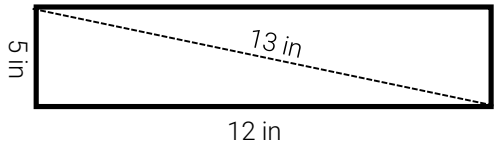
A. 1,500 ft^3

B. 15 ft^3

C. 60 ft^3

D. 150 ft^3

8. The rectangle below is cut along the dotted line to form a triangle. Which value best represents the area of the triangle?



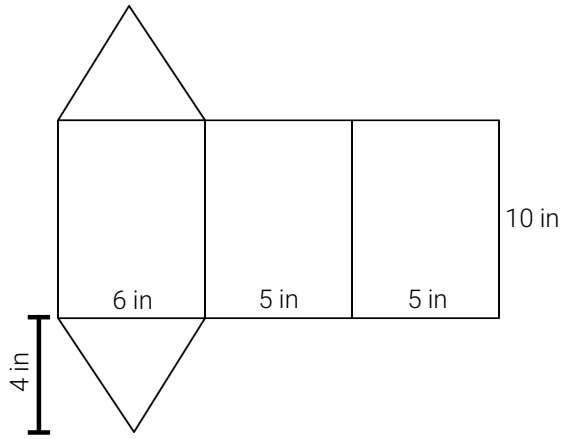
F. 78 in^2

G. 90 in^2

H. 60 in^2

J. 30 in^2

9. What is the total surface area of the triangular prism below?



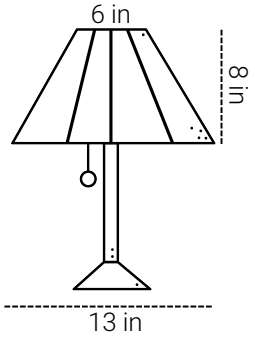
A. 204 in^2

B. 184 in^2

C. 240 in^2

D. 276 in^2

10. A sketch of a lamp is shown below. What is the area of the lamp shade in the sketch?



DATA AND STATISTICS
CHEAT SHEET - A

Name _____

Date _____Pd_____

STATISTICS VOCABULARY

MEAN: the average

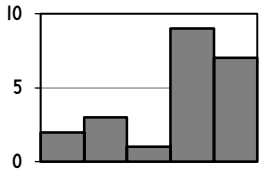
MEDIAN: middle value when ordered from least to greatest

MODE: most often repeated

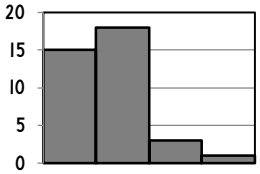
RANGE (SPREAD): the difference between the greatest and least values

SHAPE: describes the type of graph, including symmetric and skewed

SYMMETRICAL DATA: the data is evenly balanced around the mean



SKEWED LEFT

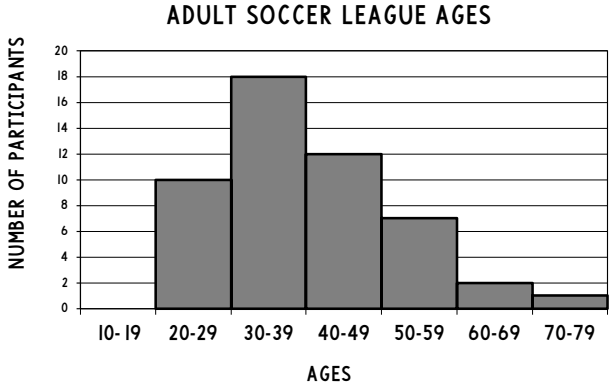


SKEWED RIGHT

HISTOGRAM: a graph that is used when data can be grouped into ranges

DISPLAYS THE FREQUENCY OF CONTINUOUS DATA

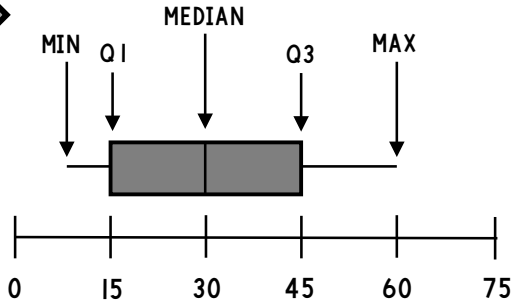
EX: WEIGHT, HEIGHT, TIME, AGE



histogram

BOX PLOTS

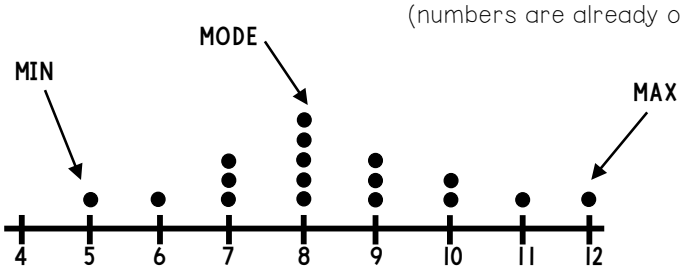
BOX PLOTS are used to compare the **SPREAD** and **DISTRIBUTION** in a set of data.



INTERQUARTILE RANGE: the difference between Q3 and Q1

RANGE: the difference between the maximum and the minimum

MEDIAN: the middle value
(numbers are already ordered in a dot plot)



dot plots

DOT PLOTS are used to display the **SPREAD OF THE DATA** along an axis.

DATA AND STATISTICS
QUICK CHECK

Name _____

Date _____Pd_____

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓕ	Ⓖ	Ⓗ	Ⓙ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓕ	Ⓖ	Ⓗ	Ⓙ

1. The number of points in the first five games of the football season are listed below. What is the mean number of points scored?

GAME 1	GAME 2	GAME 3	GAME 4	GAME 5
38	29	16	42	33

A. 33 B. 31.6 C. 26 D. 19

2. Which of the following is likely to have the greatest variability?

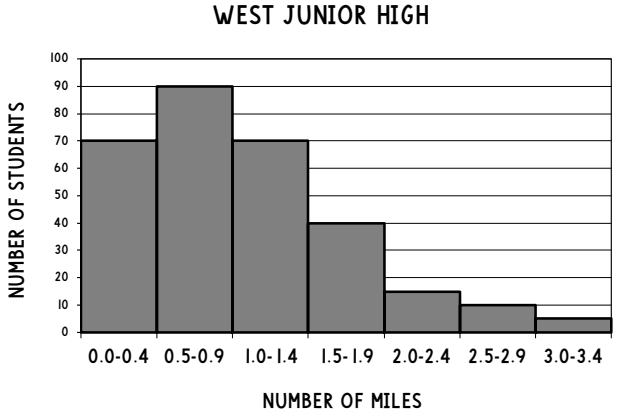
F. The cost of a piece of candy from a vending machine

G. The height of all the students at West Middle School

H. The age of all the students in the sixth grade

J. The number of days in a month

3. A survey of sixth-grade students measured how many miles they traveled to school. The distance was complied and displayed in a histogram. Which of the following statements best describes the data?



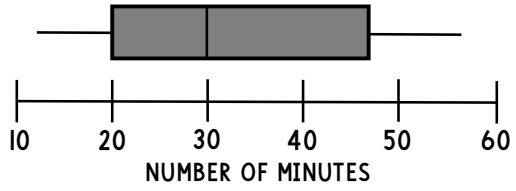
A. The data is skewed left, as most students live close to the school.

B. The data is symmetrical, as most students live far from the school.

C. The data is skewed right, as most students live close to the school.

D. The data is symmetrical, as most students live close to the school.

4. Students record the number of minutes they read each day. The box plot shows the summary of the results. Which statement best describes the data?



F. A quarter of the students read for 20-30 minutes.

G. The least number of students read less than 30 minutes.

H. Over half the students read for 40 minutes or more.

J. The average number of minutes read was 47.

5. Which of the following does **not** represent a statistical question?

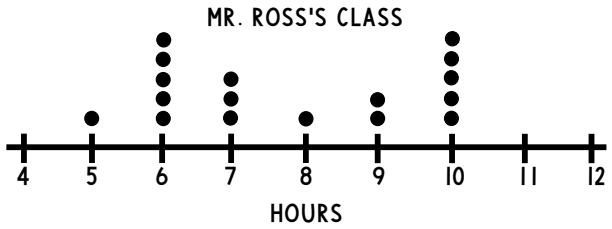
A. How tall are the students in my class?

B. How many hours per week do you practice sports?

C. How many laps can the students on the track team run?

D. How much do the students on the football team weigh?

6. The dot plot shows the number of hours the students in Mr. Ross's class slept last night. Which of the following statement is **not** correct?



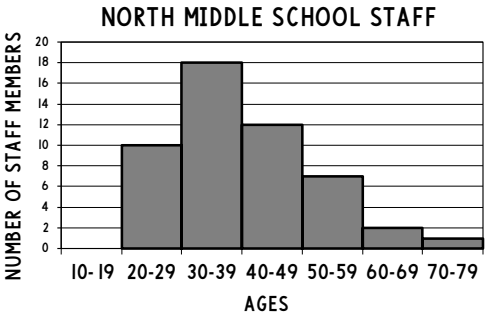
F. There are a total of 17 students in Mr. Ross's class.

G. Exactly 9 students slept for less than 8 hours.

H. More than half of the students slept for at least 7 hours.

J. All of the students in Mr. Ross's class need more sleep.

7. A survey of North Middle School staff included staff members ages. The ages were complied and displayed in a histogram. Which of the following statements best describes the data?



A. There were 12 staff members between the ages of 20-29.

B. The number of staff members under the age of 40 is equal to the number of staff members 40 and older.

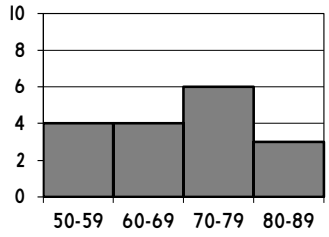
C. Sixty staff members were included in the survey.

D. A total of 10 staff members are 50 years or older.

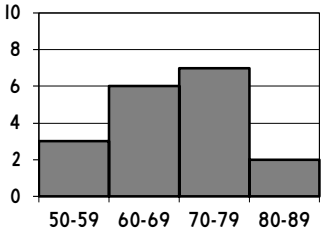
8. The number of free throws made by the members of a basketball team are shown. Which best represents the data?

54, 56, 59, 60, 61, 62, 68, 68, 72, 72, 72, 73, 75, 76, 79, 80, 80

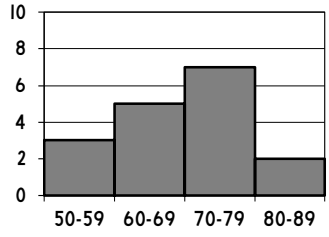
F.



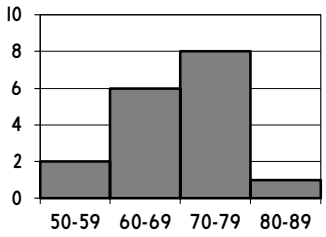
G.



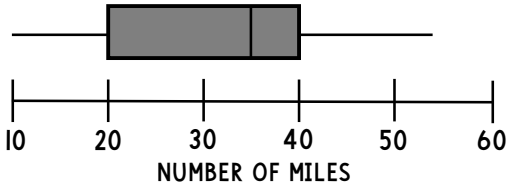
H.



J.



9. Employees were asked how many miles they traveled to work each day. The data is shown below in the box plot. Which of the statements best supports the data?



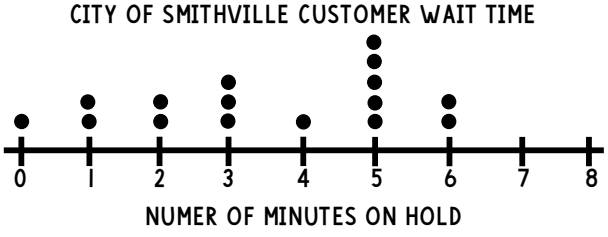
A. Median = 30, IQR = 20

B. Median = 35, IQR = 20

C. Median = 40, IQR = 45

D. Median = 35, IQR = 45

10. The City of Smithville records how many minutes a customer waits to talk to a representative on the phone. What is the mean number of minutes a customer waits?



F. 3.5 G. 4 H. 4.5 J. 5