

Dear Future 8<sup>th</sup> Graders,

Wow! Doesn't that sound great! I hope your 8<sup>th</sup> grade year will be the best year yet at Ascension.

I am sending you a summer math packet. While completing this is not mandatory, it is strongly encouraged. I know that there will be some days when you are looking for something exciting to do – and here it is!

This math packet reviews most of the concepts we covered in 7<sup>th</sup> grade. We will go over the answers and review the problems the first week of school. In the second week of school we will have a quiz over all the material. So, you might want to wait closer to the beginning of the school year to do the packet.

We will also have a quiz over the fraction/decimal/percent equivalencies you memorized these past two years, so you might want to occasionally review those flash cards.

I am looking forward to seeing you again. I hope you have a healthy and happy summer.

Mrs. Gross

Mrs. Gross

# THINGS YOU SHOULD KNOW:

## CONVERSIONS:

100 centimeters = 1 meter

12 inches = 1 foot

3 feet = 1 yard

8 ounces = 1 cup

2 cups = 1 pint

2 pints = 1 quart

4 quarts = 1 gallon

## FORMULAS:

Area of squares and

rectangles :  $A = l \cdot w$

Volume of rectangular

prisms :  $V = l \cdot w \cdot h$

## FRACTIONS:

To find a common denominator, find the least common multiple of the denominators in the problem.

## ORDER OF OPERATIONS:

**P** : Parenthesis

**E** : Exponents

**MD** : Multiplication OR

Division (from left to right)

**AS** : Addition OR

Subtraction (from left to right)

## DECIMALS:

Line up decimals when adding and subtracting.

Count decimal places when multiplying.



# Unit Rate

Determine each unit rate.



\$4.50 for 2 gallons of gas.	\$14.80 for 4 pounds of fruit.	145 miles on 9 gallons of gas.	\$25 for seven tickets.
\$14 for 6 drinks.	11 miles in 45 minutes.	918 miles in 18 hours.	240 t-shirts made in 9 hours.
210 donuts can be made in 10 hours. How many can be made in 3 hours?		An airplane travels 475 miles in 5 hours. How far will the airplane travel in 9 hours?	
You bought 11 books for \$42.35. How much would 15 books cost?		In 9 hours, 2 inches of rain fell. At this rate, how many inches would fall in 12 hours?	

# Unit Rate

Determine each unit rate.



lbs.	Total Cost (\$)
0	0
1	3
2	6
3	9

Day	# of Guests
1	100
2	200
3	300
4	400

Day	Cupcakes Sold
0	0
1	2
2	4
3	6

lbs.	Total Cost (\$)
0	0
2	3
4	6
6	9

Day	Tickets Sold
1	30
2	60
3	90
4	120

Boxes	Cost (\$)
0	0
2	10
4	20
6	30

Day	Cookies Made
0	0
3	30
6	60
9	90

Bags	Total Cost (\$)
1	5
2	10
3	15
4	20

Kids	Total Spent (\$)
10	20
20	40
30	60
40	80

Kids	Teachers
5	1
10	2
15	3
20	4

lbs.	Total Cost (\$)
0	0
4	2
8	4
12	6

Day	Number Sold
0	0
5	40
10	80
15	120

# PERCENT OF A NUMBER

Solve each problem. Round to the nearest tenth.

What is 150% of 90?	What is 1% of 41?	What is 0.4% of 42?	87 is 15% of what number?
What is 35% of 700?	What is 36% of 745?	What is 350% of 80?	24 is 40% of what number?
What is 12% of 4?	65 is 50% of what number?	What is 85% of 10?	What is 98% of 88?
What is 6% of 33?	What is 68% of 98?	90 is 60% of what number?	What is 30% of 20?

# MEASUREMENT CONVERSIONS

Convert each measurement. Round to the nearest tenth.

Convert to inches. {12 feet}	Convert to feet. {5 yards}	Convert to centimeters. {420 meters}
Convert to yards. {30 feet}	Convert to inches. {10.5 feet}	Convert to gallons. {28 quarts}
Convert to feet. {8 inches}	Convert to inches. {3.5 yards}	Convert to cups. {2 quarts}
Convert to gallons. {12 quarts}	Convert to feet. {11 yards}	Convert to cups. {7 pints}
Convert to yards. {40 inches}	Convert to inches. {30 feet}	Convert to meters. {150 centimeters}

# GCF & LCM

Find the GCF and/or LCM.



Find the GCF. 44 & 14	Find the GCF and LCM. 5 & 8 GCF : _____ LCM : _____	Find the GCF. 20 & 15
Find the GCF and LCM. 4 & 6 GCF : _____ LCM : _____	Find the GCF. 30 & 40	Find the GCF and LCM. 16 & 6 GCF : _____ LCM : _____
Find the LCM. 4, 21, 24	Find the GCF and LCM. 12 & 4 GCF : _____ LCM : _____	Find the LCM. 3 & 5
Find the GCF and LCM. 30 & 6 GCF : _____ LCM : _____	Find the LCM. 14, 20, 30	Find the GCF and LCM. 6 & 12 GCF : _____ LCM : _____

# add & SUBTRACT decimals

Find each sum or difference.

$13.2 + 6.84$

$19.12 + 0.45$

$10.362 - 1.2$

$30.5 - 3.23$

$12.89 + 4.9$

$5.032 + 9.6$

$15.5 - 3$

$16.32 - 8.1$

You buy 2.67 pounds of apples and 4.9 pounds of oranges. How many pounds of fruit did you buy?

You cut a 2.675 foot section from an 8.9 foot piece of wood. How much is left?

Gina has three rolls of ribbon. One roll has 12.6 inches, the second has 18.24 inches long and the last has 19.05 inches of ribbon. How much ribbon does she have?

Travis has a \$20 gift card. He spent \$9.62 and then another \$2.49. How much is left on the gift card?



# MULTIPLY & DIVIDE DECIMALS

Find each product or quotient.

$3.2 \cdot 4.6$	$8.9 \cdot 4.1$	$28.3 \div 5.1$	$29.2 \div 4$
$6.12 \cdot 4.3$	$9.86 \cdot 0.2$	$10.35 \div 9$	$30.4 \div 2.8$
$5.82 \cdot 1.6$	$13.45 \cdot 2.2$	A 14.24 pound bag of cheese is split among 5 pizzas. How much cheese is on each pizza?	
Veronica ran 2.5 times around a 4.62 mile course. How far did she run?		A 6.5 foot long piece of wood is cut into 5 sections. How long is each section?	

# DECIMAL WORD PROBLEMS

Read each problem carefully.

Emma is 7.8 years old. She is 1.2 times older than Gavin. How old is Gavin?

Eileen had \$2.47 left on her lunch account. She spent \$1.86 today. How much money is now left on her account?

Hank ran 1.6 miles on Monday, 2.08 miles on Tuesday and 3.65 miles on Wednesday. How many miles did he run over the three days?

Christina bought 4.2 pounds of bananas for \$0.49 per pound. How much did she spend on bananas?

Four people split a \$46.80 prize equally. How much does each person get?

Sam and Peter went fishing. Sam caught 12.67 pounds of fish and Peter caught 9.29 pounds of fish. They gave away 2.75 pounds. What is the weight of the fish they have left?

Mr. Johnson purchased 4 pieces of wood for \$1.99 each and 6 pieces for \$3.85 each. How much did he spend on wood?

Emilio makes \$12.75 per hour. How much does he make for working 8.8 hours?

# add & SUBTRACT fractions

Find each sum or difference.

$$\frac{1}{2} + 6\frac{2}{3}$$

$$\frac{5}{8} + 2$$

$$5\frac{3}{5} - 1\frac{1}{3}$$

$$10\frac{4}{5} - 3\frac{1}{2}$$

$$3\frac{1}{4} + 4\frac{1}{2}$$

$$9\frac{1}{3} + 4\frac{5}{6}$$

$$8\frac{2}{3} - 5\frac{1}{5}$$

$$4\frac{5}{6} - 1\frac{1}{8}$$

Jake ran  $3\frac{1}{2}$  miles Saturday and  $4\frac{5}{6}$  miles Sunday. How far did he run over the weekend?

Wayne ran  $3\frac{1}{2}$  miles out of a  $9\frac{2}{3}$  mile race. How much further does he have left to run?

# MULTIPLYING FRACTIONS

Find each product.

$\frac{2}{5} \cdot \frac{7}{10}$	$\frac{2}{3} \cdot 8$	$\frac{7}{8} \cdot \frac{2}{3}$	$\frac{3}{10} \cdot \frac{1}{4}$
$3\frac{1}{2} \cdot 4$	$6\frac{1}{8} \cdot 2\frac{1}{2}$	$3\frac{1}{3} \cdot 4\frac{3}{4}$	$5\frac{2}{5} \cdot \frac{9}{10}$
$8\frac{1}{3} \cdot 2\frac{1}{4}$	$3\frac{3}{5} \cdot 6\frac{1}{5}$	Kim has four pieces of ribbon that are each $12\frac{1}{5}$ inches long. How much ribbon does she have altogether?	
You ran $4\frac{1}{2}$ times around a $2\frac{1}{4}$ mile track. How far did you run?		Sasha has six boxes of chocolate that each weigh $16\frac{1}{8}$ ounces. How much chocolate does she have altogether?	

# Dividing Fractions

Find each quotient.



$\frac{2}{5} \div 8$	$\frac{5}{6} \div 4$	$\frac{7}{8} \div 2$	$\frac{9}{10} \div 4$
$3\frac{1}{2} \div 5$	$6\frac{1}{5} \div 2$	$9\frac{1}{3} \div 3$	$5\frac{2}{5} \div 2$
$5\frac{1}{2} \div \frac{3}{5}$	$\frac{7}{10} \div \frac{1}{3}$	$10\frac{1}{4} \div \frac{2}{5}$	$\frac{11}{12} \div \frac{1}{6}$
<p>A <math>4\frac{9}{10}</math> foot long piece of wood is cut into 6 sections. How long is each section?</p>		<p>You split <math>8\frac{1}{2}</math> pounds of strawberries equally among 5 containers. How many pounds of strawberries are in each container?</p>	

h. 6  
p. 5-6  
8-36

# FRACTION WORD PROBLEMS

Read each problem carefully.

<p><math>\frac{4}{7}</math> of a pizza was eaten. The next day, <math>\frac{1}{2}</math> of what was left was eaten. How much is left of the original pizza?</p>	<p>Erin brought <math>8\frac{1}{2}</math> pounds of ham to a party. Ryan brought an additional <math>2\frac{3}{5}</math> pounds. How much ham was brought to the party?</p>
<p>Yvette ran <math>4\frac{7}{8}</math> miles. Greg ran <math>1\frac{7}{10}</math> miles. How much further did Yvette run?</p>	<p>A recipe calls for <math>5\frac{1}{3}</math> cups of sugar. How much sugar will be needed if the recipe is quadrupled?</p>
<p>Betty is making <math>4\frac{1}{2}</math> dozen cookies. She needs <math>1\frac{7}{8}</math> cups of chocolate chips for one dozen cookies. How many cups of chocolate chips does Betty need?</p>	<p>A fish tank holds <math>12\frac{3}{5}</math> gallons of water. The fish tank is filled <math>\frac{5}{8}</math> of the way. How much water is in the fish tank?</p>
<p>Liz drank <math>\frac{10}{12}</math> of a gallon of water yesterday and <math>1\frac{1}{3}</math> gallons today. How much water has Liz consumed over the last two days?</p>	<p>There are 40 students in an art club. <math>\frac{2}{5}</math> of the students are females. How many students in the art club are females?</p>

# the distributive PROPERTY

Simplify each expression.

$6(x + 4)$	$2x(5 - 1)$	$10(6x - 2)$	$2(2 + 3x) + 4x$
$6(2x + 3) - 3x$	$2x(5 + 4) - 2$	$8(5x - 10)$	$3(4x - 2(2))$
$8x(5 - 2) - 3x$	$9(8x - 5) + 3$	$(5 + 3)2x + 4x$	$2(9 - 5x) - 2x$
$10(3x + 4) + 5$	$4x(4 + 2) + 10x$	$(16 - 4)4x + 3$	$4x(3 + 2) - 8 + x$

# INTEGERS IN THE REAL WORLD

Write an integer to represent each situation.

A loss of 14 pounds.	A bird flying 42 feet in the air.	A fish swimming 23 feet below the surface of the water.	A drop of 30 degrees.
A dog is 2.3 pounds overweight.	Mr. Brown is \$2,000 in debt.	A car is parked 52 feet down in an underground garage.	Brett climbed 11 feet up a ladder.
Workers dug down 15 feet to start building a home.	The price of a movie increased \$2.50.	A coupon was used for \$20 off.	A bank withdraw of \$40.
A bank deposit of \$240.	Barbara spent \$65 on groceries.	A scuba diver ascended 10 feet.	The depth of snow went from 2 inches to 6 inches.

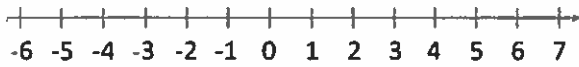


# THE NUMBER LINE

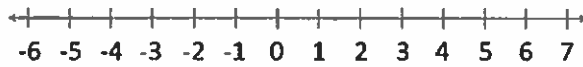
Estimate the location of each number.



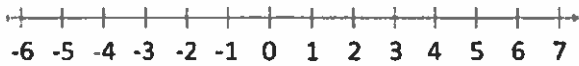
-2.4



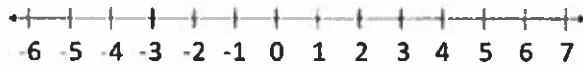
5.5



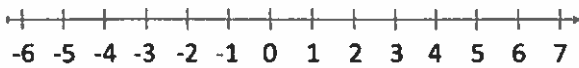
-4



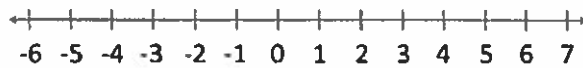
$1\frac{3}{4}$



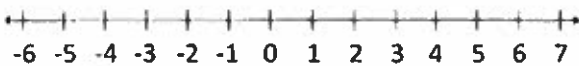
$-\frac{1}{2}$



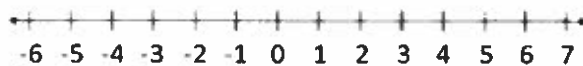
-2



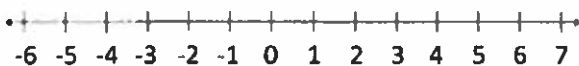
$6\frac{3}{4}$



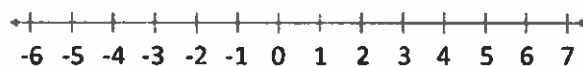
$\frac{3}{4}$



-3



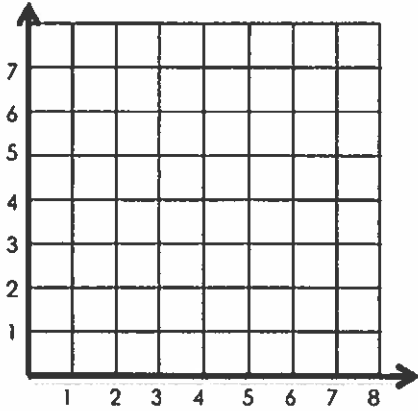
3



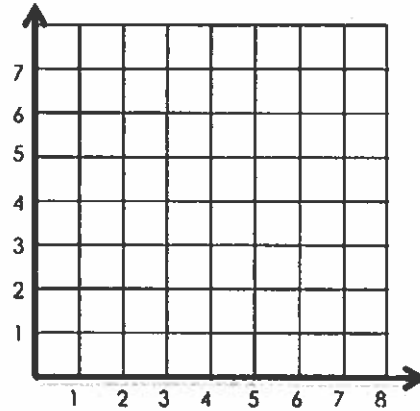
# COORDINATE PLANES

Plot the following points.

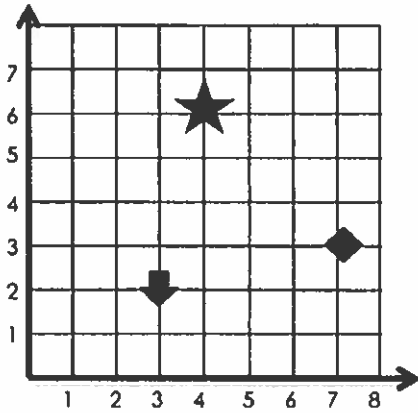
- (2, 3)
- (4, 1)
- (6, 3)
- (4, 5)



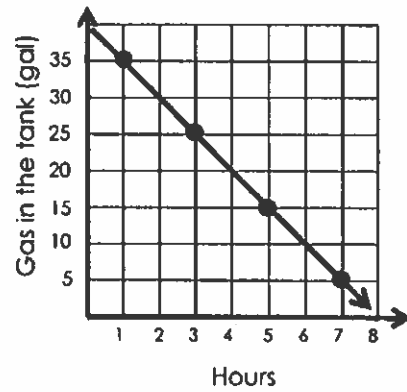
If you start at point (2, 2) and move right 3, then up 5, where do you end up?



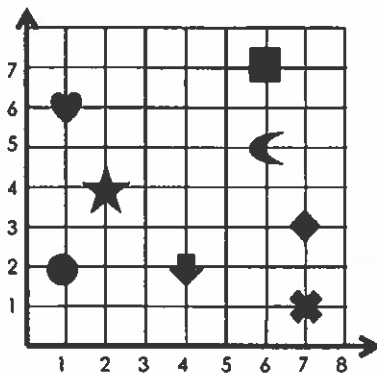
Which shape is closest to the point (2, 5)?



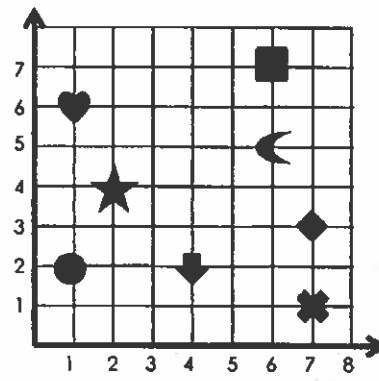
Based on the graph below, how much gas is left in the tank after 4 hours?



What shape is at (6, 7)?



What are the coordinates of the heart?

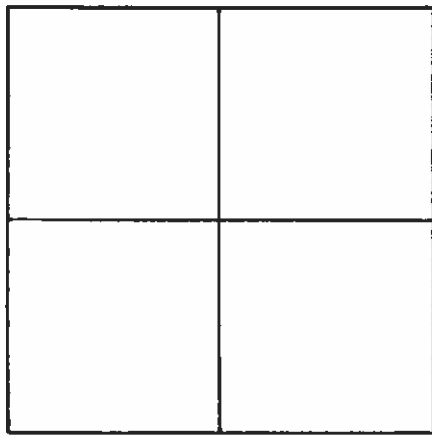


# QUADRANTS

Read each problem carefully.



Label each quadrant.



In which quadrant would you find the point  $(5, -8)$ ?

In which quadrant would you find the point  $(3, 9)$ ?

In which quadrant would you find the point  $(-4, -4)$ ?

In which quadrant would you find the point  $(-1, 6)$ ?

In which quadrant would you find the point  $(1.2, -4.5)$ ?

# absolute value

Read each problem carefully.



What is the definition of absolute value?	Find the absolute value of -5.	
How far is 6 from zero on a number line?	Is the absolute value of a number the same as the opposite? Explain.	
Find the absolute value of -4.3.	Find the absolute value of 0.	How far is -8 from zero on a number line?
Find the absolute value of 1.	Find the absolute value of 8.	Find the absolute value of 140.
Find the absolute value of -3/4.	Find the absolute value of 1.4.	Find the absolute value of -12.

# ORDERING RATIONAL NUMBERS

Put the given numbers in order.

Put the following numbers in order from least to greatest.

0.3, 0.13, 0.32, 0.303

Put the following numbers in order from greatest to least.

6.05, 6.007, 6.5, 6.25

Put the following numbers in order from greatest to least.

8.2, 0.82,  $\frac{4}{5}$ , 0.08

Put the following numbers in order from least to greatest.

$-3\frac{1}{2}$ ,  $2\frac{1}{2}$ ,  $2\frac{10}{11}$ ,  $-2\frac{1}{2}$

Put the following numbers in order from least to greatest.

$-5.2$ , 5.04,  $-5.42$ ,  $-5$ , 5.14

Put the following numbers in order from least to greatest.

$-2$ , 2.2,  $-2.2$ ,  $-2.02$ , 2

Put the following numbers in order from greatest to least.

$-\frac{2}{5}$ , 2.5,  $-0.42$ ,  $-2.2$ , 0.22

Put the following numbers in order from greatest to least.

$\frac{1}{5}$ , 0.02,  $\frac{11}{50}$ , 0.022

# ORDER OF OPERATIONS

Simplify each expression.

$260 - (2 \cdot 4)^2 - 9$	$2[3^2 + 2(5 - 1)]$	$10 + (6 \div 2)^3 - 4$	$6^2 + 2[5^2 + (2 \cdot 3)]$
$6(2 + 3) - 3^3$	$5^2 + 3[2(5 + 4)^4 - 2]$	$(2 \cdot 5)^2 - 10$	$8^2 - 2[4 - 2(2)]$
$2^4 + 14 \cdot 2 \div 4$	$9^2 \div 3^3 \cdot (8 - 5)^2$	$\frac{(5 + 3)^2}{6 - 2}$	$4^3 - 2(9)$
$2^3 + 2(3 \cdot 4)$	$40 \div 2^2 \cdot (4 - 2)^3$	$(16 - 4)^2 \cdot 4 + 3^2$	$10^2 - 2[2(3 \cdot 2)]$

# EVALUATING EXPRESSIONS

Read each problem carefully.

If $x = 4$ , evaluate: $4x - 8$	If $x = -4$ , evaluate: $-3 - x$	If $x = \frac{1}{2}$ , evaluate: $6(x + 2)$
If $x = 2.5$ , evaluate: $x - 6$	If $x = 10$ , evaluate: $2(-x + 5)$	If $x = -\frac{1}{4}$ , evaluate: $\frac{3}{4}x$
If $x = -3$ , evaluate: $3 + x - 5x$	If $x = \frac{2}{3}$ , evaluate: $3x + 8$	If $x = -5.5$ , evaluate: $-8x$
If $x = 8.2$ , evaluate: $-x + 2x$	If $x = -1$ , evaluate: $-2\frac{1}{2}x + \frac{5}{6}$	If $x = 0$ , evaluate: $-2(3x + 8)$

# SOLUTIONS TO EQUATIONS AND INEQUALITIES

Identify whether or not the given number is a solution.

$3x + 4 = 12 ; 3$	$-4x + 2 = -14 ; 4$	$\frac{x}{2} = 10 ; 5$
$5 + (-2)x = 15 ; 5$	$\frac{1}{4}x = 20 ; 40$	$5\frac{1}{2} + x = 10\frac{1}{4} ; 5\frac{1}{4}$
$5 + x \leq -10 ; -5$	$-2x > 22 ; 10$	$-x + 4 < 8 ; 10$
$-x - 2 > -3 ; -5$	$x - 5 \leq 8 ; -13$	$3x - 5 < 4 ; 3$



# WRITING EXPRESSIONS

Write an expression for each situation.

You pay \$1.25 per pound for  $x$  pounds of apples.

Emma weighs 38 pounds. Gavin weighs  $x$  pounds less.

Four friends split an \$ $x$  dinner bill.

There are 15 kids on a bus.  $x$  more get on.

You have \$ $x$  on a gift card and spend \$9.50.

It takes  $x$  days to build a house. 3 weeks have passed.

You buy  $x$  DVDs for \$15 each.

Bill used a \$10 bill to pay for a \$ $x$  cup of coffee.

Nina left an \$ $x$  tip on a \$42.60 lunch bill.

There were 325 students in 6<sup>th</sup> grade last year. There are  $x$  less this year.

A soccer team raised \$4,250 for charity last year. This year they raised \$ $x$  more.

Tim pays a moving company \$50 per hour. They help him move for  $x$  hours.

# SOLVING EQUATIONS

Solve each equation.  
Show your work.

$3x = 15$	$\frac{x}{3} = 45$	$x - (-8) = 4$
$9 + x = 2$	$-1 + x = -3$	$-x = 14$
$-3x = 18$	$\frac{-x}{5} = 20$	$\frac{1}{2}x = -8$
$4\frac{1}{2} + x = 9$	$x - 14 = -2$	$x + (-3) = -12$

# WRITING INEQUALITIES

Write an inequality to represent each situation.

A number is at least -43.	Twice a number is no more than 14.	Half a number is more than 20.
You can pay no more than \$20 for groceries.	Emily has already invited 6 friends to her party. She wants to invite at least 20 people altogether.	The temperature is at most $20^{\circ}$ outside.
7 is greater than a number.	A number is less than or equal to -15.	-8 is more than triple a number.
At least 40 students need to return their permission slips in order for the field trip to take place.	A soccer team raised more than \$4,250 for charity.	Tim earns at most \$9 an hour at his job.

# WRITING TWO-VARIABLE EQUATIONS AND INEQUALITIES

Write an inequality or equation for each situation.

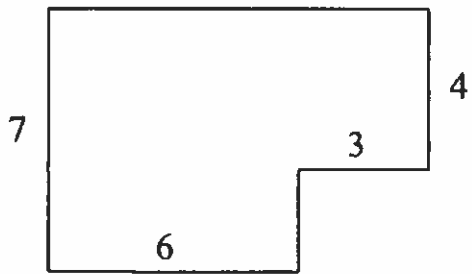
Four more than twice a number is forty.	Six less than half a number is no more than ten.	The quotient of twice a number and three is nine.
Harriett has \$150 saved. She plans to save an additional \$10 each month until she has more than \$2,000.	Ryan had \$400 on a gift card and spends \$10 each day. He now has less than \$60 on the gift card.	Brit has painted 3 portraits. She plans to paint 2 more each day until she has a total of 10.
Four times the sum of three and a number is at least twenty.	Eight more than a number is fifteen.	Nineteen is more than the sum of twice a number and three.
Ben is running and has completed 1.5 miles. He is going to run laps around a 0.5 mile track until he has completed at least 8 miles.	Drake has earned \$40 in tips. He also makes \$8 per hour. He wants to work until he has made \$100.	Kate has spent \$50. She is spending more money at a rate of \$10 per day. She wants to spend at most, \$200 this month.

# COMPOSITE AREA

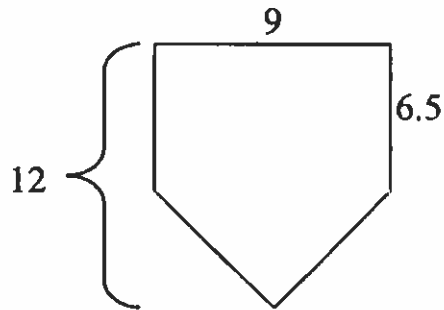
Find the area of each figure.



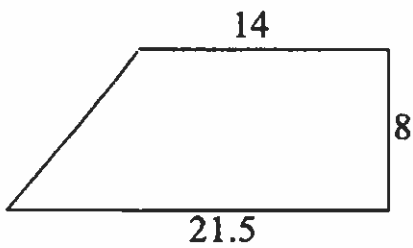
Inches:



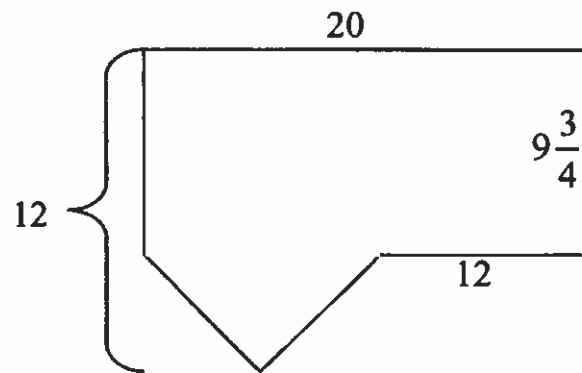
Feet:



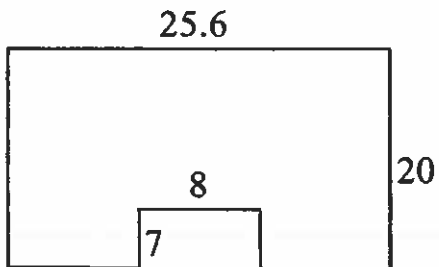
Centimeters:



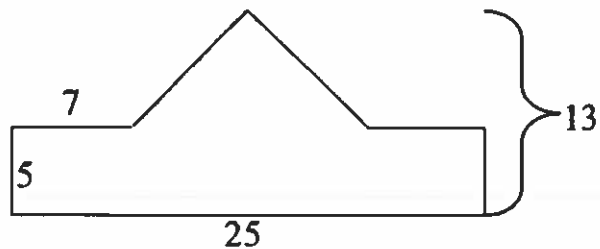
Inches:



Meters:



Yards:

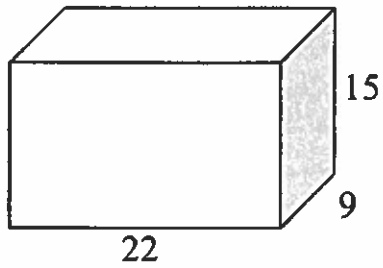


# VOLUME

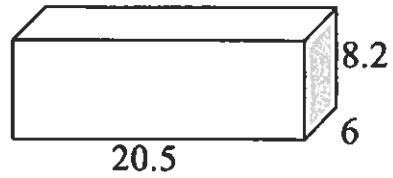
Find the volume of each figure.



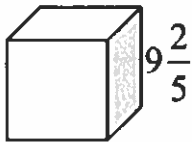
Inches



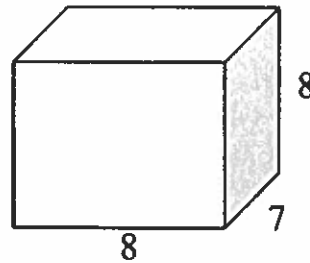
Inches



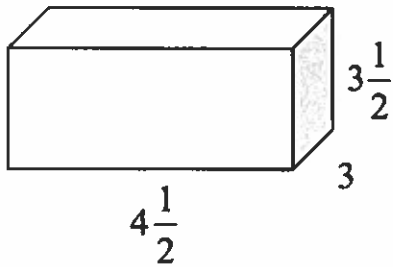
Centimeters



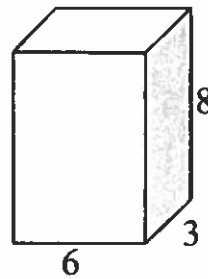
Feet



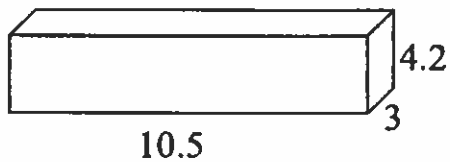
Inches



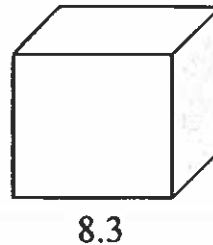
Feet



Centimeters



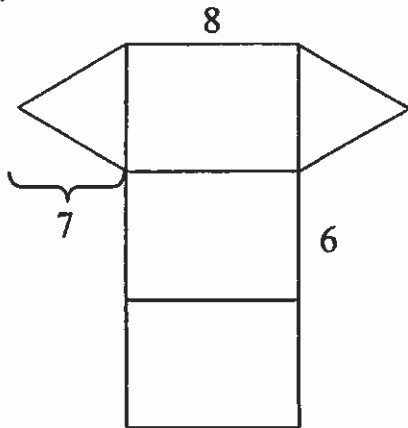
Inches



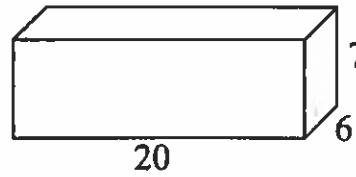
# 3d FIGURES & NETS

Read each problem carefully.

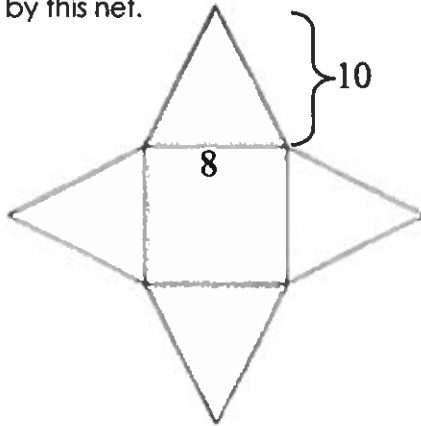
Find the surface area of the shape represented by this net.



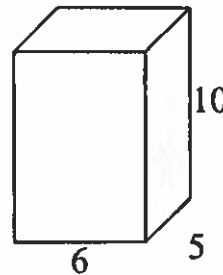
Find the surface area of the figure below.



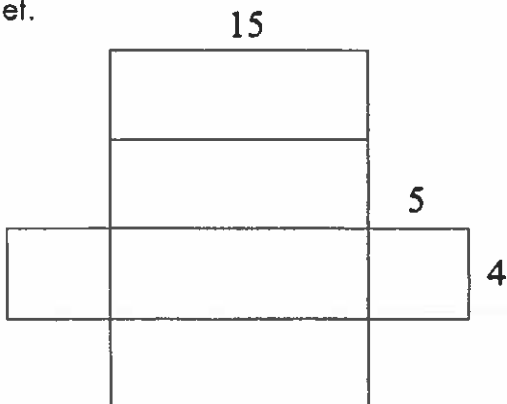
Find the surface area of the shape represented by this net.



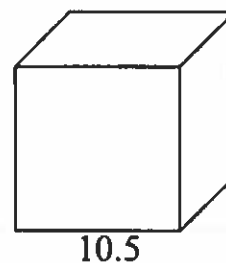
Find the volume of the figure below.



Find the volume of the shape represented by this net.



Find the surface area of the figure below.



# MEASURES OF CENTRAL TENDENCY



Show all work.



Ages of children in a camp : 5, 6, 8, 4, 6, 7, 8, 9, 12, 8, 10

Find the mean of the ages.

Find the median age.

Find the range of the ages.

Find the mode of the ages.

Height of seventh graders (inches) : 48, 60, 62, 55, 49, 52, 60, 58

Find the median height.

Find the range of the heights.

Find the mode of the heights.

Find the mean height.



# BOX PLOTS

Read each problem carefully.



For questions 1 – 2, create a box plot using the given information.

1. The ages of kids in an art club:

6, 8, 9, 8, 7, 10, 8, 9, 7, 7, 6, 9, 10, 10, 8, 8

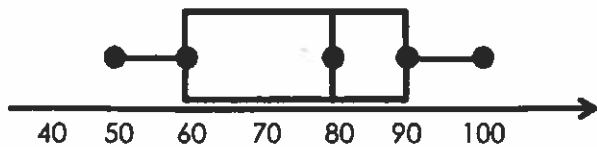


2. The height of flowers in a garden:

12, 16, 17, 15, 16, 14, 15, 16, 17, 14, 14, 16, 19, 12, 14, 17



Use the box plot below to answer questions 3 – 5.



3. The box plot shows test scores for a 10 question quiz. What percent of students scored higher than 80%?

4. The lowest 25% of students scored below what?

5. What is the median score?