6TH GRADE MATH SUMMER PACKET!

NAME: _____

Happy Summer!

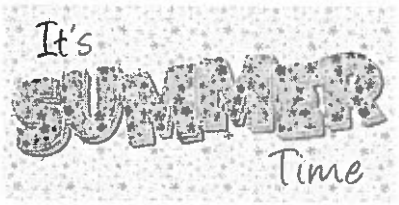
Welcome to the 6th grade math summer packet!
In here you will find practice problems for what you have learned in 6th grade math this school year. Practice makes permanent, and our goal this summer is for us to strengthen our skills and feel more confident in what we have learned!

You are expected to complete this packet by August 1st.
You will find a checklist in each "chapter" of the packet to remind you of what you have completed and what you still need to do.

If you have forgotten how to do some of these problems, no worries! There are a couple resources you can use to help refresh your memory, such as:

1) Your math note packets from 6th grade
2) The top of the packet pages (here you will find a step-by-step example(s) of each topic)
3) The QR code on the top of *some* pages (this QR code will lead you to helpful videos of the topic)
4) On-line resources such as Khan Academy or youtube videos

Try your best, and you will be amazing! Good luck practicing!
Oh, and have an AWESOME (but safe) summer!!



Chapter 1

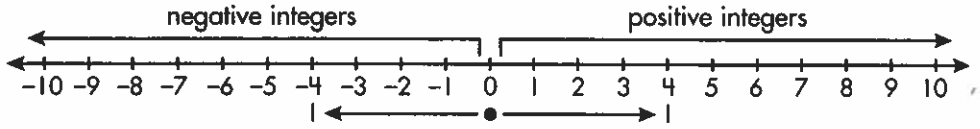
Page in Packet	Topic	Done?
Page 1	Comparing & Ordering numbers	
Page 2	Greatest Common Factor	
Page 3	Least Common Multiple	

NAME _____

Lesson 4.4 Comparing and Ordering Integers

Integers are the set of whole numbers and their opposites.

Positive integers are greater than zero. **Negative integers** are less than zero. Zero is neither positive nor negative. A negative integer is less than a positive integer. On a number line, an integer and its opposite are the same distance from zero. The smaller of two integers is always the one to the left on a number line.

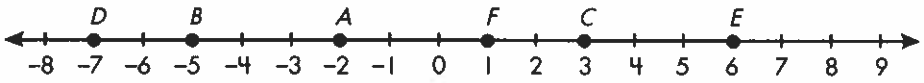


The opposite of 4 is −4. They are both 4 spaces from 0.

$-7 < -2$
−7 is to the left of −2.

$-4 > -9$
−4 is to the right of −9.

Use integers to name each point on the number line.



	a	b	c
1.	A _____	D _____	F _____
2.	E _____	C _____	B _____

Use > or < to compare each pair of numbers.

3.	2 ☐ 7	−1 ☐ −4	5 ☐ 0
4.	−4 ☐ 1	0 ☐ −8	−8 ☐ −10
5.	7 ☐ −7	−2 ☐ 0	4 ☐ 6
6.	1 ☐ −1	6 ☐ 3	−6 ☐ −3
7.	4 ☐ −2	−6 ☐ −4	3 ☐ −3

Order from least to greatest.

	a	b
8.	−3, −5, 0 _____	8, −8, 2 _____
9.	0, 5, −3, −7 _____	4, −1, 2, −2 _____
10.	−6, 5, −2, −3, 2 _____	5, −8, −2, −3, 0 _____

Page 1

Lesson 1.7 Greatest Common Factor

A **factor** is a divisor of a number. (For example, 3 and 4 are both factors of 12.) A **common factor** is a divisor that is shared by two or more numbers (1, 2, 4, and 8). The **greatest common factor** is the largest common factor shared by the numbers (8).

To find the greatest common factor of 32 and 40, list all of the factors of each.

32 < 1 × 32, 2 × 16, 4 × 8 > 1, 2, 4, 8, 16, and 32

40 < 1 × 40, 2 × 20, 4 × 10, 5 × 8 > 1, 2, 4, 5, 8, 10, 20, and 40

The greatest common factor is 8.

List the factors of each number below. Then, list the common factors and the greatest common factor.

		Factors	Common Factors	Greatest Common Factor
1.	8			
	12			
2.	6			
	18			
3.	24			
	15			
4.	4			
	6			
5.	5			
	12			
6.	16			
	12			

Page 2

NAME _____

Lesson 1.8 Least Common Multiple

Find the least common multiple by listing multiples of each number until finding the first one that is shared.

8 — 8, 16, 24
12 — 12, 24
} The Least Common Multiple is 24.

Find the least common multiple for each set of numbers.

		a		b
1.	51 and 18	_____	104 and 76	_____
2.	54 and 64	_____	20 and 26	_____
3.	78 and 110	_____	42 and 63	_____
4.	23 and 92	_____	75 and 15	_____
5.	28 and 32	_____	12 and 16	_____
6.	9, 45, and 81	_____	21, 45, and 6	_____
7.	17, 24, and 53	_____	86, 68, and 20	_____

Page 3

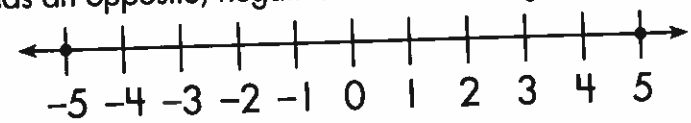
Chapter 2

Page in Packet	Topic	Done?
Page 4	Integers as Opposite numbers	
Page 5	Integer values in real life	
Page 6	Absolute value	

NAME _____

Lesson 4.1 Integers as Opposite Numbers

Every positive number has an opposite, negative number. A negative number is less than 0.



Draw a number line to show the opposite of each number.

a

1. What is the opposite of 8?
2. What is the opposite of −10?
3. What is the opposite of 12?
4. What is the opposite of −6?
5. What is the opposite of 11?
6. What is the opposite of −20?

b

What is the opposite of 25?

What is the opposite of −7?

What is the opposite of −9?

What is the opposite of 2?

What is the opposite of −14?

What is the opposite of 16?

Name the opposite of each number.

7. The opposite of 10 is _____.
8. The opposite of −3 is _____.
9. The opposite of −4 is _____.
10. The opposite of 13 is _____.
11. The opposite of −32 is _____.
12. The opposite of 17 is _____.

The opposite of 1 is _____.

The opposite of 7 is _____.

The opposite of −8 is _____.

The opposite of −15 is _____.

The opposite of 27 is _____.

The opposite of −20 is _____.

NAME _____

Lesson 4.2 Integer Values in Real Life

Integers can be used to describe real-life situations.

A driver is going 15 miles per hour below the speed limit. The integer −15 can describe this situation. The negative sign shows that the speed is less than the speed limit.

Use integers to represent each real-life situation.

	a	b
1.	45 feet below sea level _____	a gain of 8 yards on a play _____
2.	$528 deposit into a checking account _____	62° above zero _____
3.	stock market increases of 345 points _____	an 8-pound weight loss _____
4.	7,500 feet above sea level _____	withdrawal of $80 from an ATM _____
5.	a 10-pound weight gain _____	stock market decrease of 250 points _____
6.	3 units to the right on a number line _____	8 units to the left on a number line _____
7.	10 units to the left on a number line _____	7 units to the right on a number line _____
8.	$60 deposit into a savings account _____	withdrawal of $95 from an ATM _____
9.	stock market decrease of 97 points _____	34° below zero _____
10.	100 feet below sea level _____	a gain of 15 yards on a play _____
11.	a 25-pound weight loss _____	stock market increase of 390 points _____
12.	95° above zero _____	6,000 feet above sea level _____

NAME _____

Lesson 4.3 Absolute Value

The **absolute value** of a number is its distance from zero.

Absolute value is represented by vertical lines on either side of an integer.

What is the absolute value of 8? $|8| = 8$

What is the absolute value of –8? $|-8| = 8$

Find the absolute value of each integer.

	a	b	c
1.	$\|4\| =$ _____	$\|-13\| =$ _____	$-\|10\| =$ _____
2.	$-\|-7\| =$ _____	$\|11\| =$ _____	$\|-2\| =$ _____
3.	$-\|12\| =$ _____	$-\|5\| =$ _____	$\|1\| =$ _____
4.	$\|-14\| =$ _____	$-\|8\| =$ _____	$-\|-13\| =$ _____
5.	$\|3\| =$ _____	$\|-7\| =$ _____	$-\|4\| =$ _____
6.	$-\|-15\| =$ _____	$\|9\| =$ _____	$\|-12\| =$ _____
7.	$\|16\| =$ _____	$\|-6\| =$ _____	$-\|20\| =$ _____
8.	$-\|40\| =$ _____	$-\|-24\| =$ _____	$\|17\| =$ _____
9.	$\|33\| =$ _____	$-\|-41\| =$ _____	$\|-19\| =$ _____
10.	$\|26\| =$ _____	$\|-18\| =$ _____	$-\|35\| =$ _____
11.	$-\|53\| =$ _____	$\|-21\| =$ _____	$\|30\| =$ _____
12.	$\|25\| =$ _____	$-\|-21\| =$ _____	$\|-47\| =$ _____

Chapter 3

Page in Packet	Topic	Done?
Page 7	Multi-digit multiplication	
Page 8	Multi-digit division	
Page 9	Multiplying decimals	
Page 10	Dividing by two digits	
Page 11	Multiplying fractions and mixed numbers	
Page 12	Dividing fractions	

NAME _____

Lesson 1.3 Multi-Digit Multiplication

	Multiply 3,263 by 3.	Multiply 3,263 by 40.	Add.
3263 × 43	3263 × 3 9789	3263 × 40 130520	3263 × 43 9789 + 130520 140,309

Multiply.

	a	b	c	d
1.	324 × 27	816 × 16	255 × 44	2165 × 23
2.	5150 × 22	7182 × 12	6324 × 36	4522 × 63
3.	886 ×374	763 ×618	654 ×523	985 ×447
4.	2186 × 342	1898 × 475	3688 × 259	2864 × 723

NAME _____

Lesson 1.4 Multi-Digit Division

983 is between 840 (28 × 30) and 1120 (28 × 40), so the tens digit is 3.

```
      3
  28)983
   -840   subtract
    143
```

143 is between 140 (28 × 5) and 168 (28 × 6), so the ones digit is 5.

```
      35 r3
  28)983
   -840    subtract
    143
   -140    subtract
      3    remainder
```

Divide.

	a	b	c	d	e
1.	18)94	27)68	22)88	19)78	25)64
2.	43)88	12)84	32)865	24)768	31)913
3.	27)815	54)725	45)880	23)615	18)324

NAME _____

Lesson 1.9 Multiplying Decimals

The number of digits to the right of the decimal point in the product is the sum of the number of digits to the right of the decimal point of the factors.

$$\begin{array}{r} 0.4 \\ \times\ 0.2 \\ \hline 0.08 \end{array} \qquad \begin{array}{r} 0.28 \\ \times\ 0.6 \\ \hline 0.168 \end{array} \qquad \begin{array}{r} 3.2432 \\ \times\ 0.13 \\ \hline 97296 \\ +\ 32432 \\ \hline 0.421616 \end{array}$$

If needed, add zeros as place holders.

Multiply.

	a	b	c	d	e
1.	$\begin{array}{r} 0.7 \\ \times\ 8 \\ \hline \end{array}$	$\begin{array}{r} 0.08 \\ \times\ 0.5 \\ \hline \end{array}$	$\begin{array}{r} 0.325 \\ \times\ 0.3 \\ \hline \end{array}$	$\begin{array}{r} 1.68 \\ \times\ 8 \\ \hline \end{array}$	$\begin{array}{r} 25 \\ \times 0.7 \\ \hline \end{array}$
2.	$\begin{array}{r} 0.03 \\ \times 3.06 \\ \hline \end{array}$	$\begin{array}{r} 0.162 \\ \times\ 0.3 \\ \hline \end{array}$	$\begin{array}{r} 8.03 \\ \times\ 3.5 \\ \hline \end{array}$	$\begin{array}{r} 0.297 \\ \times\ 7.1 \\ \hline \end{array}$	$\begin{array}{r} 76.4 \\ \times\ 3.6 \\ \hline \end{array}$
3.	$\begin{array}{r} 53.64 \\ \times\ 0.37 \\ \hline \end{array}$	$\begin{array}{r} 328.1 \\ \times\ 0.63 \\ \hline \end{array}$	$\begin{array}{r} 9.806 \\ \times\ 31 \\ \hline \end{array}$	$\begin{array}{r} 600.3 \\ \times 0.034 \\ \hline \end{array}$	$\begin{array}{r} 895 \\ \times 0.63 \\ \hline \end{array}$
4.	$\begin{array}{r} 27.1 \\ \times 3.54 \\ \hline \end{array}$	$\begin{array}{r} 3.263 \\ \times\ 18 \\ \hline \end{array}$	$\begin{array}{r} 1.253 \\ \times\ 12 \\ \hline \end{array}$	$\begin{array}{r} 58.9 \\ \times 0.038 \\ \hline \end{array}$	$\begin{array}{r} 0.82 \\ \times 0.82 \\ \hline \end{array}$
5.	$\begin{array}{r} 0.283 \\ \times\ 0.6 \\ \hline \end{array}$	$\begin{array}{r} 0.178 \\ \times\ 53 \\ \hline \end{array}$	$\begin{array}{r} 0.83 \\ \times 0.23 \\ \hline \end{array}$	$\begin{array}{r} 3.6 \\ \times 0.025 \\ \hline \end{array}$	$\begin{array}{r} 48.2 \\ \times 0.26 \\ \hline \end{array}$

NAME _____

Lesson 1.10 Dividing by Two Digits

Multiply the divisor and dividend by 10, by 100, or by 1,000 so the divisor is a whole number.

$3.5\overline{)14.0} = 35\overline{)140}$ — Multiply by 10.

$$\begin{array}{r} 4 \\ 35\overline{)140} \\ -140 \\ \hline 0 \end{array}$$

$0.42\overline{)16.80} = 42\overline{)1680}$ — Multiply by 100.

$$\begin{array}{r} 40 \\ 42\overline{)1680} \\ -168 \\ \hline 0 \end{array}$$

$0.27\overline{)8.100} = 27\overline{)8100}$ — Multiply by 1,000.

$$\begin{array}{r} 300 \\ 27\overline{)8100} \\ -8100 \\ \hline 0 \end{array}$$

Divide.

	a	b	c	d
1.	$2.3\overline{)5.06}$	$3.4\overline{)289}$	$5.2\overline{)2.08}$	$7.2\overline{)10.8}$
2.	$0.45\overline{)18}$	$0.22\overline{)1.166}$	$0.63\overline{)25.2}$	$0.98\overline{)63.7}$
3.	$0.032\overline{)96}$	$0.015\overline{)0.45}$	$0.068\overline{)0.017}$	$0.012\overline{)0.0144}$
4.	$2.4\overline{)0.96}$	$0.62\overline{)24.8}$	$0.016\overline{)0.08}$	$0.85\overline{)5.1}$

NAME _____

Lesson 2.1 Multiplying Fractions and Mixed Numbers

Multiply fractions.

$\frac{3}{8} \times \frac{2}{3} = \frac{3 \times 2}{8 \times 3}$ Multiply numerators together. Multiply denominators together.

$= \frac{6}{24} = \frac{1}{4}$ Simplify.

Multiply mixed numbers.

$2\frac{3}{4} \times 3\frac{1}{3} = \frac{11}{4} \times \frac{10}{3}$ Rename each mixed number as an improper fraction.

$\frac{11}{4} \times \frac{10}{3} = \frac{110}{12} = \frac{55}{6}$ Multiply.

$= 9\frac{1}{6}$ Simplify.

Multiply. Write answers in simplest form.

	a	b	c	d
1.	$\frac{2}{5} \times \frac{2}{3} =$	$\frac{3}{4} \times \frac{5}{6} =$	$\frac{7}{8} \times \frac{5}{7} =$	$\frac{2}{5} \times \frac{3}{4} =$
2.	$\frac{7}{12} \times \frac{3}{4} =$	$\frac{2}{3} \times \frac{8}{9} =$	$\frac{4}{5} \times \frac{3}{8} =$	$\frac{3}{7} \times \frac{3}{5} =$
3.	$\frac{1}{6} \times \frac{2}{3} =$	$\frac{11}{12} \times \frac{2}{3} =$	$\frac{2}{5} \times \frac{2}{5} =$	$\frac{3}{4} \times \frac{3}{7} =$
4.	$1\frac{1}{3} \times 2\frac{1}{8} =$	$2\frac{1}{2} \times 1\frac{3}{4} =$	$2\frac{5}{8} \times 2\frac{3}{5} =$	$1\frac{1}{2} \times 2\frac{2}{3} =$
5.	$3\frac{1}{5} \times 5\frac{2}{3} =$	$4\frac{1}{2} \times 4\frac{1}{2} =$	$2\frac{1}{3} \times 3\frac{1}{4} =$	$2\frac{4}{5} \times 3\frac{1}{8} =$
6.	$2\frac{2}{3} \times 5\frac{1}{4} =$	$2\frac{1}{3} \times 2\frac{1}{3} =$	$3\frac{1}{4} \times 1\frac{1}{8} =$	$2\frac{7}{8} \times 1\frac{1}{3} =$

NAME _____

Lesson 2.3 Dividing Fractions

To divide, multiply by the reciprocal of the divisor.

$\frac{4}{5} \div \frac{8}{9} = \frac{4}{5} \times \frac{9}{8} = \frac{36}{40} = \frac{9}{10}$

Divide. Write answers in simplest form.

	a	b	c	d
1.	$\frac{1}{2} \div \frac{3}{5}$	$\frac{3}{8} \div \frac{2}{3}$	$\frac{5}{8} \div \frac{3}{4}$	$\frac{2}{5} \div \frac{3}{8}$
2.	$\frac{1}{2} \div \frac{7}{8}$	$\frac{4}{5} \div \frac{3}{4}$	$\frac{5}{6} \div \frac{3}{8}$	$\frac{2}{3} \div \frac{4}{5}$
3.	$\frac{7}{8} \div \frac{1}{3}$	$\frac{7}{9} \div \frac{2}{3}$	$\frac{1}{3} \div \frac{2}{3}$	$\frac{5}{6} \div \frac{1}{3}$
4.	$\frac{3}{5} \div \frac{2}{3}$	$\frac{4}{9} \div \frac{3}{7}$	$\frac{1}{2} \div \frac{5}{8}$	$\frac{2}{3} \div \frac{7}{9}$

Chapter 4

Page in Packet	Topic	Done?
Page 13	Understanding ratios	
Page 14	Solving ratios	
Page 15	Solving ratio problems	

NAME _____

Lesson 3.1 Understanding Ratios

A **ratio** compares 2 numbers. When written out, several phrases can show how the ratio should be written.

4 to 2	4:2	$\frac{4}{2}$ or $\frac{2}{1}$
6 out of 8	6:8	$\frac{6}{8}$ or $\frac{3}{4}$

Express each ratio as a fraction in simplest form.

	a	b
1.	15 feet out of 36 feet _____	5 pounds to 35 pounds _____
2.	48 rainy days out of 60 days _____	28 snow days out of 49 days _____
3.	10 pints to 20 pints _____	40 cups to 55 cups _____
4.	10 miles out of 12 miles _____	28 red bikes out of 40 bikes _____
5.	18 beetles out of 72 insects _____	63 gallons to 84 gallons _____
6.	49 dimes out of 77 coins _____	12 cakes out of 36 cakes _____
7.	15 students out of 30 students _____	3 floors out of 18 floors _____
8.	36 meters out of 100 meters _____	14 hats out of 20 accessories _____
9.	80 scores out of 90 scores _____	2 sports out of 19 sports _____
10.	42 cars out of 124 cars _____	7 messages out of 84 messages _____

NAME _____

Lesson 3.2 Solving Ratios

A proportion can be used in problem solving.

The ratio of apples to oranges is 4 to 5. There are 20 oranges in the basket. How many apples are there?

$\frac{4}{5} = \frac{n}{20}$	Set up a proportion, using n for the missing number.
$4 \times 20 = 5 \times n$	Cross-multiply.
$\frac{80}{5} = n$	Solve for n.
$16 = n$	There are 16 apples.

Solve.

	a	b	c
1.	$\frac{1}{3} = \frac{n}{24}$ _____	$\frac{4}{9} = \frac{n}{36}$ _____	$\frac{5}{45} = \frac{n}{9}$ _____
2.	$\frac{3}{5} = \frac{n}{15}$ _____	$\frac{10}{70} = \frac{n}{7}$ _____	$\frac{25}{40} = \frac{n}{16}$ _____
3.	$\frac{7}{12} = \frac{n}{36}$ _____	$\frac{13}{26} = \frac{n}{4}$ _____	$\frac{7}{1} = \frac{n}{3}$ _____
4.	$\frac{8}{5} = \frac{n}{40}$ _____	$\frac{2}{6} = \frac{n}{33}$ _____	$\frac{5}{13} = \frac{n}{39}$ _____
5.	$\frac{5}{6} = \frac{n}{18}$ _____	$\frac{9}{8} = \frac{n}{32}$ _____	$\frac{2}{3} = \frac{n}{15}$ _____

NAME _____

Lesson 3.3 Solving Ratio Problems

Tables can be used to help find missing values in real-life ratio problems.

A car can drive 60 miles on two gallons of gas. Create a table to find out how many miles the car can travel on 10 gallons of gas.

Gas	2 gallons	4 gallons	6 gallons	8 gallons	10 gallons
Miles	60 miles	120 miles	180 miles	240 miles	300 miles

Complete the tables to solve the ratio problems. Circle your answer in the table.

1. You can buy 4 cans of green beans at the market for $2.25. How much will it cost to buy 12 cans of beans?

Cans	4 cans	8 cans	12 cans
Cost	$2.25		

2. An ice-cream factory makes 180 quarts of ice cream in 2 hours. How many quarts could be made in 12 hours?

Ice Cream	180 quarts					
Hours	2 hours	4 hours	6 hours	8 hours		

3. A jet travels 650 miles in 3 hours. At this rate, how far could the jet fly in 9 hours?

Distance	650 miles		
Hours	3 hours		

4. A bakery can make 640 bagels in 4 hours. How many can they bake in 16 hours?

Bagels	640 bagels			
Hours	4 hours			

Chapter 5

Page in Packet	Topic	Done?
Page 16	Understanding unit rates	
Page 17	Problem solving	

NAME _____

Lesson 3.4 Understanding Unit Rates

A **rate** is a special ratio that compares quantities of two different types of items—for example, *340 miles per 10 gallons (340 mi./10 gal.)*. In a **unit rate**, the second quantity is always 1, such as in *34 miles per gallon (34 mi./1 gal.)*. This allows you to see how many of the first item corresponds to just one of the second item.

Suppose you want to divide students equally between buses for a field trip. To see how many students should go on each bus, find the unit rate.

If there are 160 students and 4 buses, how many students should go on each bus?

$\frac{160}{4} = \frac{s}{1}$ To find the number of students for one bus, divide by the number of buses tc

$\frac{160}{4} = \frac{40}{1}$ The unit rate is $\frac{40}{1}$, or 40 students per bus.

SHOW YOUR WORK

Solve each problem by finding the unit rate.

1. John can create 20 paintings in 4 weeks. How many paintings can he create each week?

1.

2. Sasha can walk 6 miles in 3 hours. If she has to walk 1 mile, how long will it take her?

2.

3. Todd keeps his 4-room house very clean. It takes him 1 hour and 36 minutes to clean his whole house. How long does it take him to clean one room?

3.

4. Victoria can make 8 necklaces in 4 days. How long does it take her to make one necklace?

4.

5. Byron has his own bakery. He bakes 84 cakes each week. How many cakes can he make in one day?

5.

6. Charlie buys 3 computer tables for $390. How much did he pay for each table?

6.

NAME _____

Lesson 3.5 Problem Solving

SHOW YOUR WORK

Solve the problems below using ratios and unit rates.

1. Gas mileage is the number of miles you can drive on a gallon of gasoline. A test of a new car results in 440 miles driven on 20 gallons of gas. How far could you drive on 60 gallons of gas? _____

   What is the car's gas mileage? _____

1.

2. An ice-cream factory makes 100 quarts of ice cream in 5 hours. How many quarts could be made in 36 hours? _____

   What was that rate per day? _____

2.

3. A jet travels 590 miles in 5 hours. At this rate, how far could the jet fly in 10 hours? _____

   What is the rate of speed of the jet? _____

3.

4. You can buy 5 cans of green beans at the Village Market for $2.30, or you can buy 10 of them at Best Food for $5.10.

   Which place is the better buy? _____

4.

5. You can buy 3 apples at the Quick Stop for $1.29. You can buy 5 apples at Shop and Save for $2.45.

   Which place is the better buy? _____

5.

6. A ferris wheel can accommodate 55 people in 15 minutes.

   How many people could ride the ferris wheel in 2 hours? _____

   What is the rate per hour? _____

6.

Chapter 6

Page in Packet	Topic	Done?
Page 18	Understanding percents	
Page 19	Finding percents using fractions	

NAME _____

Lesson 3.6 Understanding Percents

The symbol % (percent) means $\frac{1}{100}$ or 0.01 (one hundredth).

$7\% = 7 \times \frac{1}{100} = \frac{7}{1} \times \frac{1}{100} = \frac{7}{100}$

$6\% = 6 \times 0.01 = 0.06$

$23\% = 23 \times \frac{1}{100} = \frac{23}{100}$

$47\% = 47 \times 0.01 = 0.47$

Write the fraction and decimal for each percent. Write fractions in simplest form.

	Percent	Fraction	Decimal
1.	2%		
2.	8%		
3.	27%		
4.	13%		
5.	68%		
6.	72%		
7.	56%		
8.	11%		
9.	3%		
10.	22%		
11.	17%		
12.	83%		
13.	97%		
14.	43%		

Page 18

Chapter 7

Page in Packet	Topic	Done?
Page 20	Parts of an expression	
Page 21	Writing expressions	

NAME _____

Lesson 5.2 Parts of an Expression

A **variable** is a symbol, usually a letter of the alphabet, that stands for an unknown number, or quantity. a = variable

An **algebraic expression** is a combination of numbers, variables, and at least one operation. $x + 13$

A **term** is a number, variable, product, or quotient in an algebraic expression. In $3a + 5$, $3a$ is a term and 5 also is a term.

The term $3a$ means $3 \times a$. The number 3 is the coefficient of a. A **coefficient** is a number that multiplies a variable. In the expression $x + 5$, the coefficient of x is understood to be 1.

An **equation** is a sentence that contains an equal sign. $x + 13 = 25$

Identify each of the following as an *expression* or an *equation*.

	a	b	c
1.	$3 + x$ _____	$7 + 4 = 11$ _____	$55 \times n$ _____
2.	$x - 7 = 15$ _____	$b - 45$ _____	$24 = 6 \times 4$ _____

For each term below, identify the coefficient and the variable.

	a	b
3.	$3x$ coefficient _____ variable _____	$4y$ coefficient _____ variable _____
4.	z coefficient _____ variable _____	$5n$ coefficient _____ variable _____
5.	$7b$ coefficient _____ variable _____	m coefficient _____ variable _____
6.	r coefficient _____ variable _____	$6d$ coefficient _____ variable _____

Translate each phrase into an algebraic expression.

7.	five more than n _____	eight decreased by x _____
8.	x added to seven _____	the product of n and 11 _____

Translate each sentence into an equation.

9.	Six times a number is 18. _____	Seventy less a number is 29. _____
10.	Eight divided by a number is 2. _____	The product of 7 and 12 is 84. _____

Write the following expressions in words.

11. $6 - n = 3$ _____

12. $5 \times 13 = 65$ _____

NAME _____

Lesson 5.3 Writing Expressions

An **equation** is a number sentence that contains an equal sign.
An **expression** is a number phrase without an equal sign.
Equations and expressions may contain only numerals, or they also may contain variables. A **variable** is a symbol, usually a letter, that stands for an unknown number.

	Equation	*Expression*
Numerical	$3 \times 5 = 15$	$9 + 2$
Variable	$2n + 2 = 18$	$a - 5$

All equations and expressions express an idea.

3×4 means "three 4s." $6 \div 3 = 2$ means "6 divided by 3 is 2."

$n - 7$ means "n decreased by 7" or "a number decreased by 7."

$4n + 2 = 6$ means "four times a number, plus 2, is 6" or "4ns, plus 2, is 6."

Translate each phrase into an expression or an equation.

	a	b
1.	x increased by 5 _____	12 divided by a number _____
2.	seven ns _____	c less than 7 _____
3.	a number added to 15 is 23 _____	one-fourth of x _____
4.	p added to 6 _____	the product of 15 and m _____

Translate each sentence into an equation. Use n for an unknown number.

5. 11 decreased by a number is 7. _____

6. 8 times a number, plus 4, is 84. _____

7. A number divided by 5 is 6. _____

Write each expression in words.

8. $n - 5$ _____

9. $3n \div 6$ _____

Chapter 8

Page in Packet	Topic	Done?
Page 22	Solving 1-step equations: Addition and Subtraction	
Page 23	Solving 1-step equations: Multiplication and division	
Page 24	Solving inequalities	

NAME _____

Lesson 5.5 Solving 1-Step Equations: Addition & Subtraction

Subtraction Property of Equality

If you subtract the same number from each side of an equation, the two sides remain equal.

$x + 12 = 20$

To undo the addition of 12, subtract 12.

$x + 12 - 12 = 20 - 12$
$x + 0 = 8$
$x = 8$

Addition Property of Equality

If you add the same number to each side of an equation, the two sides remain equal.

$n - 3 = 15$

To undo the subtraction of 3, add 3.

$n - 3 + 3 = 15 + 3$
$n - 0 = 18$
$n = 18$

Write the operation that would undo the operation in the equation.

	a	b
1.	$x - 4 = 3$ _____	$8 = b + 4$ _____
2.	$y + 7 = 25$ _____	$3 = a - 7$ _____

Solve each equation.

	a	b	c
3.	$a - 4 = 2$ _____	$y + 5 = 9$ _____	$x - 3 = 14$ _____
4.	$7 = x - 4$ _____	$b + 7 = 19$ _____	$y + 5 = 5$ _____
5.	$z - 7 = 5$ _____	$m - 5 = 5$ _____	$n + 1 = 1$ _____
6.	$x + 7 = 10$ _____	$x - 3 = 18$ _____	$x + 0 = 9$ _____
7.	$b + 4 = 4$ _____	$b - 8 = 12$ _____	$n + 8 = 12$ _____
8.	$z - 10 = 20$ _____	$z + 5 = 20$ _____	$x - 2 = 8$ _____

Write and solve the equation for each problem below.

9. Kelley went to the movies. She took 20 dollars with her. When she came home, she had 6 dollars. How much money did she spend? _____

9.

10. There are 27 students in Mrs. Yuen's homeroom. Twelve of them have home computers. How many students do not have home computers?

_____

10.

NAME _____

Lesson 5.6 Solving 1-Step Equations: Multiplication & Division

Division Property of Equality

If you divide each side of an equation by the same nonzero number, the two sides remain equal.

$3y = 21$

To undo multiplication by 3, divide by 3.

$\frac{3y}{3} = \frac{21}{3}$

$y = 7$

Multiplication Property of Equality

If you multiply each side of an equation by the same number, the two sides remain equal.

$\frac{a}{4} = 4$

To undo division by 4, multiply by 4.

$\frac{a}{4} \times \frac{4}{1} = 5 \times 4$

$a = 20$

Write the operation that would undo the operation in each equation.

	a	b
1.	$5 \times n = 40$ _____	$\frac{y}{5} = 80$ _____
2.	$\frac{x}{2} = 8$ _____	$a \times 7 = 42$ _____

Solve each equation.

	a	b	c
3.	$3 \times a = 9$ _____	$\frac{x}{5} = 5$ _____	$\frac{n}{4} = 3$ _____
4.	$\frac{x}{3} = 3$ _____	$n \times 4 = 4$ _____	$3 \times y = 24$ _____
5.	$5 \times b = 10$ _____	$\frac{b}{8} = 2$ _____	$4 \times a = 20$ _____
6.	$\frac{m}{3} = 1$ _____	$8 \times n = 20$ _____	$\frac{x}{5} = 2$ _____
7.	$4 \times n = 1$ _____	$\frac{n}{4} = 5$ _____	$\frac{b}{3} = 27$ _____
8.	$n \times 15 = 30$ _____	$\frac{n}{4} = 10$ _____	$n \times 12 = 36$ _____
9.	$\frac{n}{18} = 2$ _____	$n \times 3 = 18$ _____	$n \times 2 = 20$ _____
10.	$\frac{n}{2} = 20$ _____	$\frac{n}{16} = 1$ _____	$n \times 3 = 3$ _____
11.	$5 \times b = 30$ _____	$\frac{b}{5} = 30$ _____	$n \times 8 = 24$ _____
12.	$\frac{n}{4} = 1$ _____	$\frac{b}{2} = 2$ _____	$n \times 6 = 48$ _____

NAME _____

Lesson 5.8 Solving Inequalities

Inequalities can be solved the same way that equations are solved.

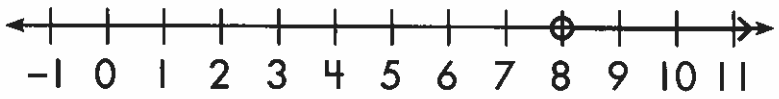
$6 + q > 14$

$6 + q - 6 > 14 - 6$

$q > 8$

1. Subtract 6 from both sides of the inequality to isolate the variable on one side of the inequality.

2. The variable q represents a value that is greater than 8.



A number line can be used to represent the possible values of the variable. An open circle shows that the values do not include 8. For inequalities that use $\leq$ or $\geq$, a closed circle indicates that the values do include that point.

Solve the inequalities and represent the possible values of the variable on a number line.

1. $6 > z - 2$

2. $g + 7 < -12$

3. $d - 5 < 7$

4. $15 > k + 2$

5. $1 + x > -16$

6. $y + 8 < -9$

7. $8 \leq 8 + r$

8. $w + 8 \geq 11$

Chapter 9

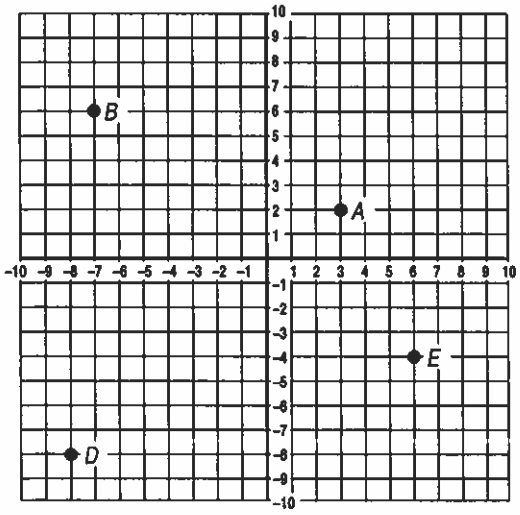
Page in Packet	Topic	Done?
Page 25	Using integers in the coordinate plane	
Page 26	Dependent and independent variables	

NAME _____

Lesson 4.5 Using Integers in the Coordinate Plane

Positive and negative coordinates can be graphed using the coordinate plane system.

The first number in an ordered pair represents its position on the *x*-axis. The second number represents the position on the *y*-axis.



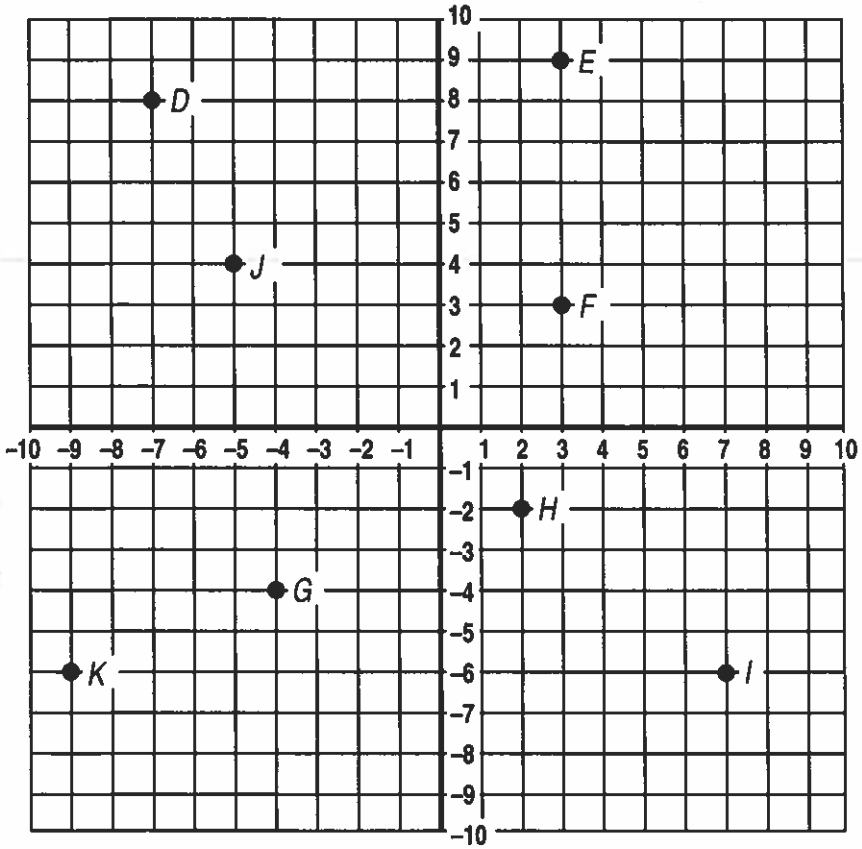
Point *A*: (3, 2)

Point *B*: (–7, 6)

Point *C*: (6, –4)

Point *D*: (–8, –8)

Use the coordinate grid to answer the questions.



Write the ordered pair for each point.

1. *D* _____

2. *E* _____

3. *G* _____

4. *H* _____

5. *K* _____

Name the point located at each ordered pair.

6. (–5, 4) _____

7. (7, –6) _____

8. (–9, –6) _____

9. (3, 3) _____

10. (–7, 8) _____

NAME _____

Lesson 5.9 Dependent and Independent Variables

Sometimes word problems contain dependent and independent variables. The **dependent variable** in a problem is the value that is affected by the other values in the problem. The **independent variable** is the value that affects the outcome of the dependent variable.

If a car has to travel 200 miles, the speed (s) the car is driving is the independent variable and the time (t) it takes to make the trip is the dependent variable. This can be represented by the formula, $200 = s \times t$, and can be solved by creating a table.

Dependent Variable	Time	5 hours	4 hours	$3\frac{1}{3}$ hours
Independent Variable	Speed	40 miles/hr.	50 miles/hr.	60 miles/hr.

Use tables to identify the variables and find possible solutions to the problems.

1. Maria has to buy apples at the grocery store. Apples cost $1.25 per pound. How much will Maria spend on apples?

   What equation will you use? _____

Dependent Variable				
Independent Variable				

2. When a tree is planted, it is 6 feet tall. Each month, it grows by 2 feet. How tall will it get over time?

   What equation will you use? _____

_____ **Variable**	Height			
_____ **Variable**	Time	3 months	6 months	2 years

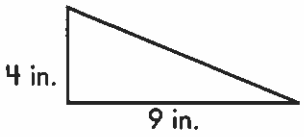
Chapter 10

Page in Packet	Topic	Done?
Page 27	Calculating area: triangles	
Page 28	Calculating area: quadrilaterals	
Page 29	Calculating area: other polygons	

NAME _____

Lesson 6.1 Calculating Area: Triangles

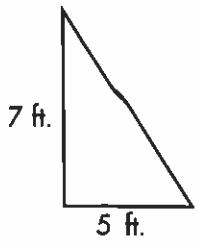
The area (A) of a triangle is one-half the of the base (b) times the height (h).



$$A = \frac{1}{2} \times b \times h$$

or

$$A = \frac{1}{2}bh$$



$A = \frac{1}{2} \times 9 \times 4$

$= \frac{1}{2} \times 36$

$= 18$

$A = 18$ square inches

$A = \frac{1}{2} \times 5 \times 7$

$= \frac{1}{2} \times 35$

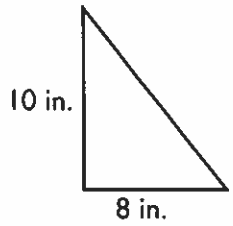
$= 17\frac{1}{2}$

$A = 17\frac{1}{2}$ square feet

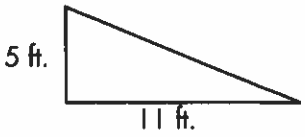
Find the area of each right triangle.

a **b**

1.

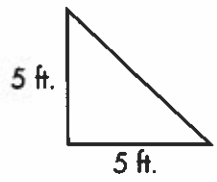


$A =$ _____ sq. in.

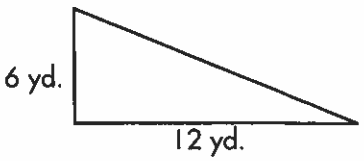


$A =$ _____ sq. ft.

2.



$A =$ _____ sq. ft.



$A =$ _____ sq. yd.

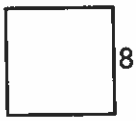
Page 27

NAME _____

Lesson 6.2 Calculating Area: Quadrilaterals

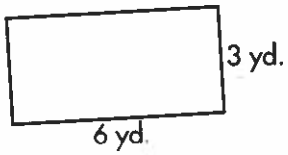
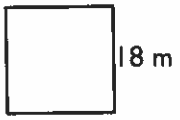
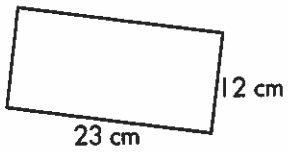
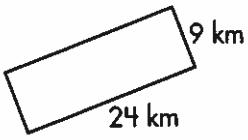
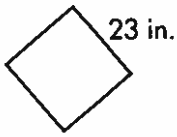
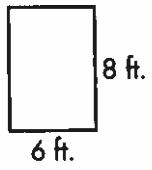
Area is the number of square units it takes to cover a figure. To find the **area of a rectangle**, multiply the length by the width. $A = lw$

$A = 7 \times 2$
$A = 14$ square units

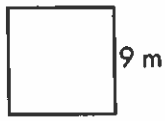


$A = s \times s = 8 \times 8$
$A = 64$ square units

Find the area of each rectangle below.

	a	b	c
1.			
	$A =$ _____ sq. yd.	$A =$ _____ sq. m	$A =$ _____ sq. cm
2.			
	$A =$ _____ sq. km	$A =$ _____ sq. in.	$A =$ _____ sq. ft.

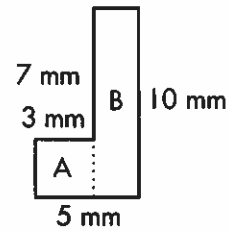
Find the length of each rectangle below.

3.			
	$A = 54$ sq. in.	$A = 58.5$ sq. ft.	$A = 81$ sq. m
	$\ell =$ _____ in.	$\ell =$ _____ ft.	$\ell =$ _____ m

NAME _____

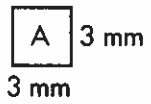
Lesson 6.3 Calculating Area: Other Polygons

To find the area of an irregular shape, separate the shape into its component figures and find the area of each one.



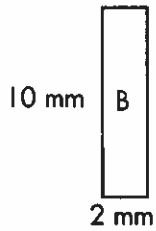
This figure can be divided into two rectangles, as shown by the dotted line.

To find the missing side measurement of shape A, look at the vertical measurements you already know: 10 mm and 7 mm. Because the missing side must be the difference between 10 and 7, subtract to get the answer: $10 - 7 = 3$ mm.



To find the area of shape A, multiply $l \times w$.

$3 \times 3 = 9$ mm



Follow the same steps to find the area of shape B.

$5 - 3 = 2$ mm

$A = 10 \times 2 = 20$ mm

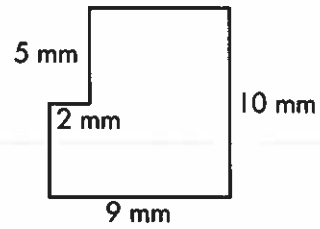
Then, add the two areas together to get the area of the entire irregular shape.

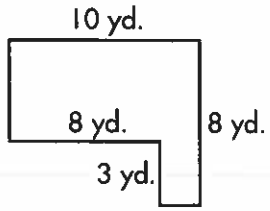
$9 + 20 = 29$ square mm

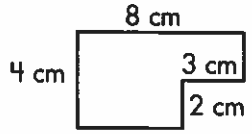
Find the area of each figure.

a **b** **c**

1.

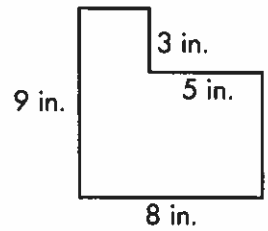


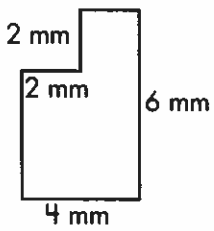


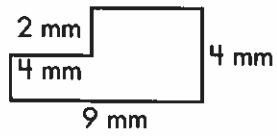


$A =$ _____ sq. mm $A =$ _____ sq. yd. $A =$ _____ sq. cm

2.







$A =$ _____ sq. in. $A =$ _____ sq. mm $A =$ _____ sq. mm

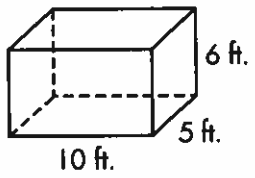
Chapter 12

Page in Packet	Topic	Done?
Page 30	Volume of rectangular solids	
Page 31	Surface area: rectangular solids	
Page 32	Surface area: pyramids	

NAME _____

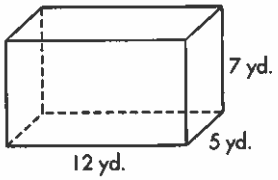
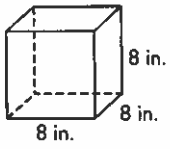
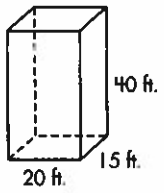
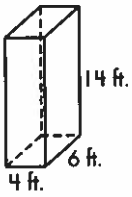
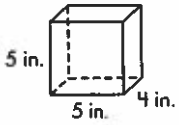
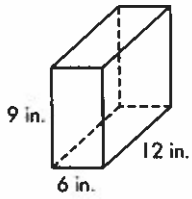
Lesson 6.4 Volume of Rectangular Solids

The **volume** (V) of a rectangular solid is the product of the measure of its length (ℓ), the measure of its width (w), and the measure of its height (h). $V = \ell \times w \times h$



$V = 10 \times 5 \times 6$
$= 50 \times 6$
$= 300$
The volume is 300 cubic feet.

Find the volume of each rectangular solid.

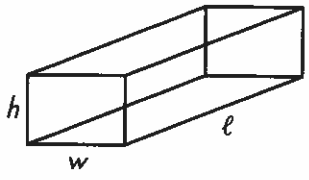
	a	b	c
1.			
	$V =$ _____ cu. yd.	$V =$ _____ cu. in.	$V =$ _____ cu. ft.
2.			
	$V =$ _____ cu. ft.	$V =$ _____ cu. in.	$V =$ _____ cu. in.

NAME _____

Lesson 6.6 Surface Area: Rectangular Solids

The **surface area** of a solid is the sum of the areas of all surfaces of the solid. A rectangular solid has 6 surfaces.

The area of each surface is determined by finding:



length × width, length × height, width × height

The total surface area is found using this formula:

$SA = 2\ell w + 2\ell h + 2wh$

If $\ell = 10$ m, $w = 6$ m, and $h = 4$ m, the surface area is found as follows:

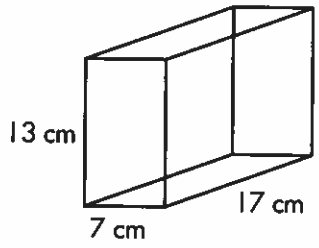
$SA = 2(10 \times 6) + 2(10 \times 4) + 2(6 \times 4)$

$SA = 2(60) + 2(40) + 2(24) = 120 + 80 + 48 = 248 \text{ m}^2$

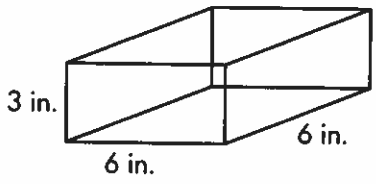
Find the surface area of each rectangular solid.

a **b** **c**

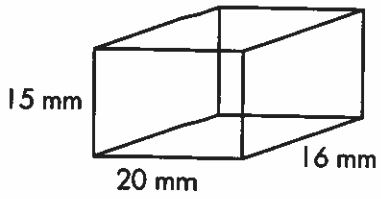
1.



$SA =$ _____ cm^2

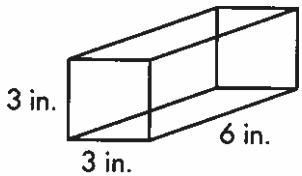


$SA =$ _____ in.^2

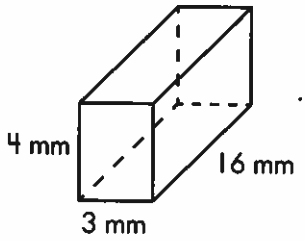


$SA =$ _____ mm^2

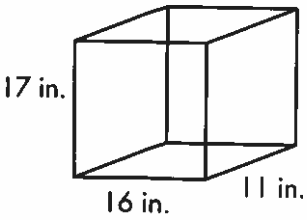
2.



$SA =$ _____ in.^2



$SA =$ _____ mm^2

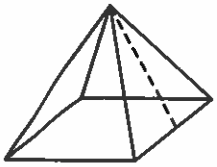


$SA =$ _____ in.^2

NAME _____

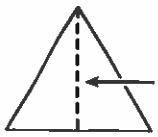
Lesson 6.7 Surface Area: Pyramids

The **surface area** of a solid is the sum of the areas of all surfaces of the solid. The surface area of a square pyramid is the sum of the area of the square base and each of the 4 triangular sides.


side

Each triangle's area is $\frac{1}{2}$ base × height. In a pyramid, **base** refers to the side length and **height** refers to the slant height, or length. So surface area or SA = (side × side) + 4($\frac{1}{2}$ side × length).

$SA = s^2 + 2s\ell$ SA is given in **square units**, or **units²**.


slant height, or *length* (ℓ) of the side

If s = 6 cm and ℓ = 10 cm, what is the surface area?

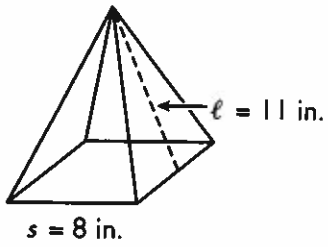
$SA = s^2 + 2s\ell$

$SA = 6^2 + 2 \times 6 \times 10 = 36 + 120 = 156$ cm²

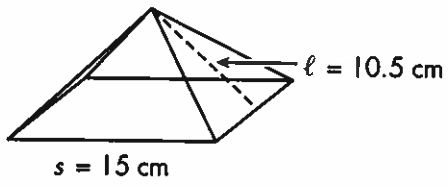
Find the surface area of each square pyramid.

a **b** **c**

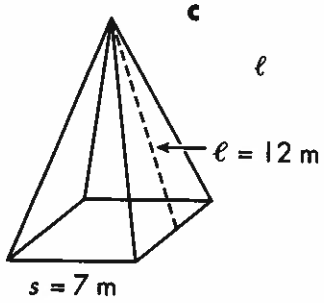
1.



SA = _____ in.²

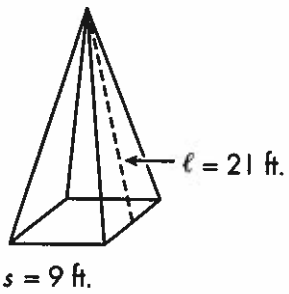


SA = _____ cm²

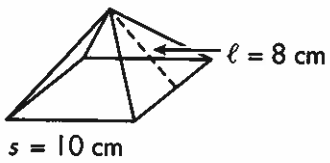


SA = _____ m²

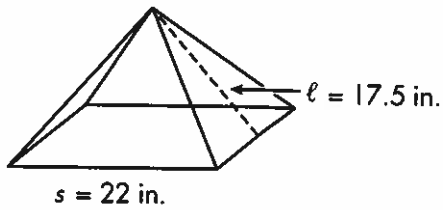
2.



SA = _____ ft.²



SA = _____ cm²



SA = _____ in.²

Chapter 13

Page in Packet	Topic	Done?
Page 33	Plotting data: stem-and-leaf plots	
Page 34	Plotting data: box-and-whisker plots	
Page 35	Plotting data: line graphs	
Page 36	Plotting data: histograms	

NAME _____

Lesson 7.12 Plotting Data: Stem-and-Leaf Plots

A set of data can be organized into a **stem-and-leaf plot** by using place values.

87, 38, 35, 76, 48, 57, 68, 44, 63, 49, 63, 64, 71

The tens digits are the stems and the ones digits are the leaves.

Stem	Leaves
3	5 8
4	4 8 9
5	7
6	3 3 4 8
7	1 6
8	7

Key: 3 | 5 = 35

This allows you to see the least (35), the largest (87), the range (52), the median (63), and the mode (63).

Create a stem-and-leaf plot for each set of data. Include a key for each plot.

	a	b
1.	14, 31, 34, 21, 13, 28, 33	63, 38, 72, 54, 50, 79, 64, 39, 57, 49
2.	48, 38, 34, 25, 27, 37, 49	88, 96, 99, 75, 87, 93, 81, 84, 91, 73
3.	19, 25, 38, 17, 24, 33, 13	26, 37, 25, 33, 35, 46, 27, 45, 23, 41

NAME _____

Lesson 7.13 Plotting Data: Box-and-Whisker Plots

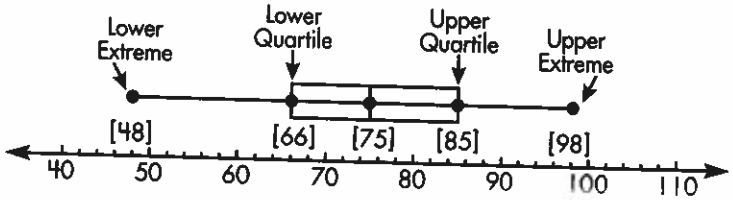
Box-and-whisker plots are helpful in interpreting the distribution of data. For example, the results of a test might include these 15 scores:

66, 56, 75, 77, 98, 72, 48, 83, 73, 89, 65, 74, 87, 85, 81

The numbers should be arranged in order:

48, 56, 65, 66, 72, 73, 74, 75, 77, 81, 83, 85, 87, 89, 98

The median is 75. The **lower quartile** is the median of the lower half (66). The **upper quartile** is the median of the upper half (85). Draw a box around the median with its ends going through the quartiles. Each quartile contains one-fourth of the scores.

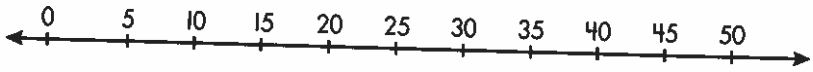


Answer the questions using the box-and-whisker plot above.

1. Half of the students scored higher than _____ on the test.
2. _____ scores are represented in the box part of the plot.
3. The range of the scores on the test is _____.

The scores on a recent daily quiz were 10, 15, 20, 20, 30, 30, and 40.

4. What is the median of these scores? _____
5. What is the lower quartile? _____
6. What is the upper quartile? _____
7. Using the number line below, draw a box-and-whisker plot for these scores.



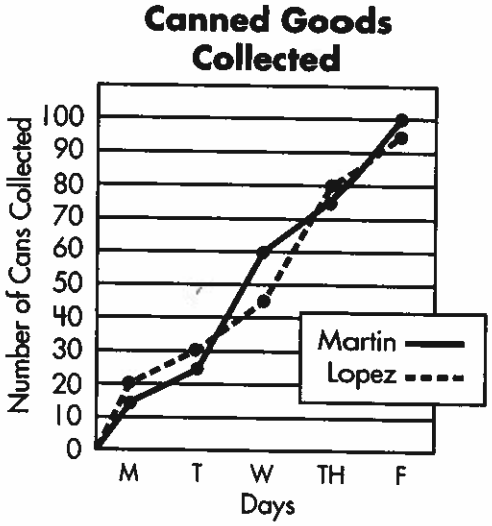
NAME _____

Lesson 7.14 Plotting Data: Line Graphs

Mrs. Martin's homeroom and Mr. Lopez's homeroom had a canned food drive. The **line graph** shows how many cans were collected after each day.

On Monday, how many more cans did Mr. Lopez's class collect than Mrs. Martin's class?

Mr. Lopez's class collected __5__ more cans than Mrs. Martin's class on Monday.



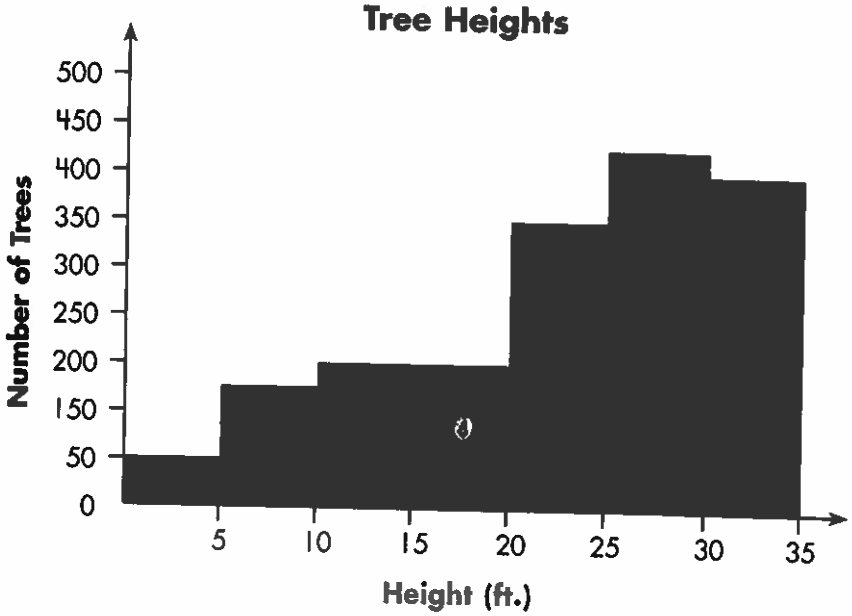
Use the line graph above to answer the following questions

1. On Monday, whose homeroom collected the most cans? _____
2. By Tuesday, how many cans had Mr. Lopez's homeroom collected? _____
3. On which day was the difference between the number of cans collected by each homeroom the greatest? _____
4. Which homeroom collected the most cans on that day? _____
5. How many cans total had been collected by both homerooms by Tuesday? _____
6. On what day did Mrs. Martin's homeroom bring in the most cans? _____
7. On what day did Mr. Lopez's homeroom bring in the most cans? _____
8. On what day did Mrs. Martin's homeroom bring in the least number of cans? _____
9. By Wednesday, how many cans had been collected by both homerooms? _____
10. How many cans were collected by both homerooms during the week? _____

NAME _____

Lesson 7.15 Plotting Data: Histograms

A **histogram** displays data using bars of different heights. It is different from a bar graph because it shows data grouped into ranges. Both axes of a histogram should be numerical.



Use the histogram above to answer the following questions.

1. How many trees were measured in all? _____
2. In what range did the most trees fall? _____
3. In what range did the least trees fall? _____
4. What percentage of trees were less than 20 feet tall? _____
5. What percentage of trees were greater than 20 feet tall? _____
6. How many more trees were 30–35 feet tall than 20–25 feet tall? _____
7. What is the range of heights shown? _____
8. Predict how many trees would be in the 35–40 foot range if it were included on the graph. _____
9. Explain the basis for your prediction.

_____

10. Draw a star above the bar where a tree that measures 21 feet would be included.

Chapter 14

Page in Packet	Topic	Done?
Page 37	Measures of Center: Mean	
Page 38	Measures of Center: Median	
Page 39	Measures of Center:Mode	
Page 40	Finding Measures of Center	
Page 41	Measures of variability: range	
Page 42	Measures of variability: interquartile range	
Page 43	Measures of variability: mean absolute deviation	

NAME _____

Lesson 7.3 Measures of Center: Mean

The **mean** of a data set is computed by adding all of the numbers in the data together and dividing by the number of values contained in the data set.

84, 66, 102, 114, 78, 90

$84 + 66 + 102 + 114 + 78 + 90 = 534$

$6\overline{)534}$ (89)

89

1. Add all of the values in the data set together.
2. Divide the sum by the number of values in the data set.
3. The mean of the data set is 89.

Find the mean of each data set.

	a	b
1.	48, 64, 80, 48	85, 75, 90, 60, 80
	_____	_____
2.	84, 140, 105, 119, 105, 84, 105	102, 78, 114, 96, 96, 102
	_____	_____
3.	119, 140, 119, 91, 91, 126, 91	96, 108, 78, 96, 72, 102
	_____	_____
4.	52, 52, 64, 80	55, 90, 70, 90, 85
	_____	_____
5.	112, 140, 77, 126, 91, 77, 133	90, 84, 72, 102, 84, 66
	_____	_____
6.	99, 89, 46, 97, 17, 75	60, 31, 24, 50, 44, 88
	_____	_____

NAME _____

Lesson 7.4 Measures of Center: Median

The **median** of a data set is the middle number when the values are placed in order from least to greatest. If there are an even number of values in the data set, the median is the average of the two middle terms.

35, 29, 26, 37, 21, 38, 38

21, 26, 29, 35, 37, 38, 38

→ 35 ←

35

1. Put the data in order from least to greatest.
2. Count in from the outside to find the middle value.
3. The median of this data set is 35.

Find the median of each data set.

	a	b
1.	23, 31, 32, 34, 39, 38, 38, 34, 38	24, 20, 28, 19, 18, 11, 19, 18, 19
2.	19, 11, 28, 13, 23, 14, 28	3, 9, 6, 2, 1, 10, 1, 2, 1
3.	26, 34, 24, 37, 36, 22, 34, 26, 34	10, 2, 3, 4, 6, 7, 6
4.	23, 32, 38, 40, 30, 34, 23	15, 21, 23, 16, 19, 14, 23, 14, 23
5.	10, 3, 5, 1, 7, 8, 5, 1, 5	51, 87, 77, 93, 67, 81, 77, 93, 77
6.	78, 35, 85, 93, 62, 95, 88, 51, 45	97, 64, 25, 26, 8, 24, 36, 72, 56

NAME _____

Lesson 7.5 Measures of Center: Mode

The **mode** of a data set is the value that occurs the most often. Sometimes a data set has more than one mode. Sometimes a data set does not have a mode.

2, 6, 1, 8, 10, 3, 10, 1, 10

1, 1, 2, 3, 6, 8, 10, 10, 10

(1, 1) 2, 3, 6, 8, 10, (10, 10)

10

1. Put the data in order from least to greatest.
2. Look for values that occur more than once.
3. The value that occurs the most times is the mode.

Find the mode for each data set.

	a	b
1.	3, 2, 8, 5, 1, 4, 4, 3, 4	39, 25, 40, 38, 22, 37, 40
	_____	_____
2.	24, 16, 26, 12, 28, 23, 28, 26, 28	118, 115, 108, 124, 106, 120, 108
	_____	_____
3.	16, 18, 12, 15, 21, 26, 26	32, 28, 22, 36, 24, 35, 24, 32, 24
	_____	_____
4.	253, 295, 204, 151, 118, 277, 277	22, 16, 14, 15, 25, 21, 21
	_____	_____
5.	95, 73, 55, 69, 72, 65, 73, 72, 73	3, 8, 4, 2, 7, 10, 4
	_____	_____
6.	14, 93, 14, 96, 13, 5, 84, 69, 93	92, 44, 32, 82, 86, 59, 22, 32
	_____	_____

NAME _____

Lesson 3.7 Finding Percents Using Fractions

$35\% \text{ of } 60 = 35\% \times 60$
$= \frac{35}{100} \times 60$
$= \frac{7}{20} \times \frac{60}{1} = \frac{420}{20} = \frac{42}{2}$
$= 21$

$40\% \text{ of } 32 = 40\% \times 32$
$= \frac{40}{100} \times 32$
$= \frac{2}{5} \times \frac{32}{1} = \frac{64}{5}$
$= 12\frac{4}{5}$

Complete the following. Write each answer in simplest form.

	a	b
1.	8% of 65 = _____	95% of 80 = _____
2.	30% of 32 = _____	25% of 28 = _____
3.	150% of 12 = _____	25% of 30 = _____
4.	28% of 7 = _____	10% of 38 = _____
5.	40% of 20 = _____	15% of 45 = _____
6.	80% of 80 = _____	20% of 75 = _____
7.	45% of 70 = _____	18% of 45 = _____
8.	4% of 92 = _____	16% of 90 = _____
9.	90% of 60 = _____	25% of 86 = _____
10.	12% of 40 = _____	9% of 60 = _____
11.	60% of 60 = _____	95% of 20 = _____
12.	21% of 50 = _____	3% of 25 = _____

NAME _____

Lesson 7.6 Finding Measures of Center

The **mean** is the average of a set of numbers. To find the mean, add all the numbers and divide by the number of values in the set.

The **median** is the middle number of a data set. If there are two middle numbers, the median is the average of the two.

The **mode** is the number that appears most often in a data set.

Example: 12, 15, 18, 23, 8, 10, and 12
Mean: 12 + 15 + 18 + 23 + 8 + 10 + 12 = 98 $\frac{98}{7} = 14$

To find the median, arrange the numbers in order. 8, 10, 12, 12, 15, 18, 23
Median: 12 Mode: 12

Find the mean, median, and mode of each data set. If needed, round to the nearest tenth. Show your work.

	a	b
1.	32, 35, 25, 43, 43	8, 12, 23, 12, 15
	mean _____	mean _____
	median _____	median _____
	mode _____	mode _____
2.	10, 18, 12, 14, 12, 12	17, 15, 15, 28, 20, 26
	mean _____	mean _____
	median _____	median _____
	mode _____	mode _____
3.	52, 61, 79, 78, 56, 79, 71	37, 50, 67, 83, 34, 49, 37
	mean _____	mean _____
	median _____	median _____
	mode _____	mode _____

NAME _____

Lesson 7.8 Measures of Variability: Range

The **range** of a data set is the difference between the largest value and smallest value contained in the data set.

11, 12, 15, 15, 13, 12

11, 12, 12, 13, 15, 15 — 1. Put the data set in order from least to greatest.

11, 12, 12, 13, 15, 15 — 2. Find the largest value and smallest value.

15 − 11 = — 3. Subtract.

4 — 4. The range of this data set is 4.

Find the range of each data set.

	a	b
1.	11, 10, 12, 9 _____	79, 79, 79, 84 _____
2.	25, 30, 32, 23, 27, 22 _____	96, 94, 101, 96, 91, 92 _____
3.	36, 33, 37, 37, 41, 33 _____	506, 508, 510, 509 _____
4.	277, 280, 287, 276 _____	10, 8, 9, 12, 6, 8 _____
5.	12, 9, 16, 9 _____	95, 92, 89, 97, 94, 88 _____

NAME _____

Lesson 7.9 Measures of Variability: Interquartile Range

The **interquartile range** (IQR) of a data set is the difference between the median of the lower half of a data set and the median of the upper half of the same data set.

13, 15, 9, 35, 25, 17, 19

9, 13, 15, 17, 19, 25, 35 — 1. Put the data set in order from least to greatest.

9, 13, 15 17 19, 25, 35 — 2. Find the lower half, median, and upper half of the data set.

Q1=13 Q3=25 — 3. Find the medians of the lower half and upper half.

25 − 13 = — 4. Subtract.

12 — 5. The interquartile range of the data set is 12.

Find the interquartile range for each set of data.

	a	b
1.	6, 1, 3, 8, 5, 11, 1, 5 median: _____ Q1: _____ Q3: _____ IQR: _____	80, 90, 95, 85, 70 median: _____ Q1: _____ Q3: _____ IQR: _____
2.	70, 75, 90, 100, 95 median: _____ Q1: _____ Q3: _____ IQR: _____	45, 43, 13, 11, 5, 2 median: _____ Q1: _____ Q3: _____ IQR: _____
3.	45, 39, 17, 16, 4, 1 median: _____ Q1: _____ Q3: _____ IQR: _____	29, 58, 15, 75, 22, 16, 64 median: _____ Q1: _____ Q3: _____ IQR: _____

Page 42

NAME _____

Lesson 7.10 Measures of Variability: Mean Absolute Deviation

The **mean absolute deviation** (MAD) of a data set is a value that shows if the data set is consistent. The closer the mean absolute deviation of a data set to zero, the more consistent it is.

17, 19, 8, 32, 21, 24, 19

8, 17, 19, 19, 21, 24, 32	1. Put the data set in order from least to greatest.
Mean = 20	2. Find the mean of the data set.
12, 3, 1, 1, 1, 4, 12	3. Find the absolute value of the difference between the mean and each value in the set. (For example, 20 – 8 = 12; |12| = 12)
Mean = 4.86	4. Find the mean of those absolute values.
MAD = 4.86	5. The mean absolute deviation of this data set is 4.86. This tells us that the values in the set are on average about 4.86 away from the middle.

Find the mean absolute deviation of each data set. Round each answer to two decimal places.

	a	b
1.	10, 16, 18, 15, 15, 10, 23	41, 56, 38, 45, 55, 51, 52
	mean: _____	mean: _____
	value differences:	value differences:
	_____	_____
	MAD: _____	MAD: _____
2.	10, 12, 18, 25, 25, 11, 22	22, 33, 44, 55, 66, 88, 55, 55, 11, 22
	mean: _____	mean: _____
	value differences:	value differences:
	_____	_____
	MAD: _____	MAD: _____