Wheeler Middle School
Summer Math Packet
Grade 6 into 7

- This packet is designed to help you retain the information you learned in 6th grade and help you transition into 7th grade.
- This packet is available on the school website for download.
- If you need help, you may use the following websites:

  www.khanacademcy.com

  www.IXL.com
- You are expected to know all of your basic facts as you enter 7th grade. Here are some sites to help you:

  www.sheppardsoftware.com

  www.xtramath.org

  https://www.factmonster.com/math/flashcards
- **This is due the first day of school, August 22nd**

Name: _____

"If you do not use it, you lose it."

Material in this packet taken from Bridgewater/Raynham Regional School District

NO Calculators! Show work for every problem on separate sheet of paper!

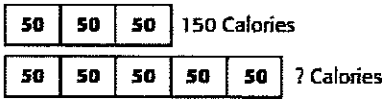
Ratio and Rate Problems

You can solve rate and ratio problems by using a bar diagram or by using a unit rate.

Example 1

NUTRITION Three servings of broccoli contain 150 Calories. How many Calories will 5 servings contain?

Method 1 Use a bar diagram.



Draw a bar diagram to represent the situation.

Each section represents 150 ÷ 3, or 50 Calories.

So, 5 servings of broccoli contain 250 Calories.

Method 2 Use a unit rate.

Step 1 Find the unit rate. $\frac{150 \text{ Calories}}{3 \text{ servings}} = \frac{\text{Calories}}{1 \text{ serving}}$ (÷3) $\quad \frac{150 \text{ Calories}}{3 \text{ servings}} = \frac{50 \text{ Calories}}{1 \text{ serving}}$

Step 2 Multiply. $\frac{50 \text{ Calories}}{1 \text{ serving}} \times 5 \text{ servings} = 250 \text{ Calories}$

You can also solve ratio and rate problems by using equivalent fractions.

Example 2

SURVEY In one survey, three out of five students agreed that the school needs a new cafeteria. Predict how many of the 600 students in the school would agree that the school needs a new cafeteria.

agree → $\frac{3}{5} = \frac{\quad}{600}$ ← agree, ← total

Write a ratio comparing the number of students who agree to the total number of students.

$\frac{3}{5} = \frac{360}{600}$ (×120)

Since 5 × 120 = 600, multiply 3 by 120.

So, 360 students would agree that the school needs a new cafeteria.

Solve.

1. **MUSIC** Jeremy spent $33 on 3 CDs. At this rate, how much would 5 CDs cost?

2. **AQUARIUM** At an aquarium, 6 out of 18 deliveries are plants. Out of 15 deliveries in one week, how many are plants?

3. **ELECTIONS** Three out of four students surveyed in a school said they will vote for Nuncio for class president. Predict how many of the 340 students in the school would vote for Nuncio.

NO Calculators! Show work for every problem on separate sheet of paper!

Decimals and Fractions

Decimals like 0.58, 0.12, and 0.08 can be written as fractions.

To write a decimal as a fraction, you can follow these steps.

1. Identify the place value of the last decimal place.

2. Write the decimal as a fraction using the place value as the denominator, and simplify.

Example 1

Write 0.5 as a fraction in simplest form.

$0.5 = \frac{5}{10}$ 0.5 means five tenths.

$= \frac{\overset{1}{\cancel{5}}}{\cancel{10}_{2}}$ Simplify. Divide the numerator and denominator by the GCF, 5.

$= \frac{1}{2}$ So, in simplest form, 0.5 is $\frac{1}{2}$.

Example 2

Write 0.35 as a fraction in simplest form.

$0.35 = \frac{35}{100}$ 0.35 means 35 hundredths.

$= \frac{\overset{7}{\cancel{35}}}{\cancel{100}_{20}}$ Simplify. Divide the numerator and denominator by the GCF, 5.

$= \frac{7}{20}$ So, in simplest form, 0.35 is $\frac{7}{20}$.

Example 3

Write $\frac{3}{5}$ as a decimal.

Since 5 is a factor of 10, write an equivalent fraction with a denominator of 10.

$$\frac{3}{5} \overset{\times 2}{=} \frac{6}{10} = 0.6$$

So, $\frac{3}{5} = \frac{6}{10}$.

Write each decimal as a fraction or mixed number in simplest form.

1. 0.9 **2.** 0.8 **3.** 0.27 **4.** 0.75

5. 0.34 **6.** 0.125 **7.** 0.035 **8.** 0.008

Write each fraction or mixed number as a decimal.

9. $1\frac{3}{8}$ **10.** $1\frac{5}{8}$ **11.** $3\frac{5}{16}$ **12.** $4\frac{9}{20}$

NO Calculators! Show work for every problem on separate sheet of paper!

Percents and Fractions

To write a percent as a fraction, write it as a fraction with a denominator of 100. Then simplify.

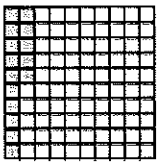
Example

Write 15% as a fraction in simplest form.

15% means *15 out of 100.*

$15\% = \frac{15}{100}$ Definition of percent

$= \frac{\overset{3}{\cancel{15}}}{\underset{20}{\cancel{100}}}$ or $\frac{3}{20}$ Simplify. Divide the numerator and denominator by the GCF, 5.



You can write fractions as percents. To write a fraction as a percent, find an equivalent ratio with 100 as the denominator.

Example 2

Write $\frac{1}{4}$ as a percent.

$\frac{1}{4} = \frac{\quad}{100}$ Write equivalent ratios.

$\frac{1}{4} \overset{\times 25}{=} \frac{25}{100}$ Since 4 × 25 = 100, multiply 1 by 25 to find the unknown value.

So, $\frac{1}{4} = \frac{25}{100}$ or 25%

Write each percent as a fraction in simplest form.

1. 20%
2. 35%
3. 70%
4. 60%
5. 30%
6. 25%

Write each fraction as a percent.

7. $\frac{3}{10}$
8. $\frac{2}{100}$
9. $\frac{8}{25}$
10. $\frac{1}{5}$
11. $\frac{7}{20}$
12. $\frac{13}{100}$

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Percent of a Number

Example 1: Find 25% of 260

Method 1:

Write 25% as a fraction in simplest form.
Use the fraction in a multiplication problem.

$$25\% = \frac{25}{100} \text{ or } \frac{1}{4}$$
$$25\% \text{ of } 260 = \frac{1}{4} \times 260$$
$$= 65$$

So, 25% of 260 is 65.

Method 2:

Write 25% as a decimal.
Then write a multiplication problem.

$$25\% = 0.25$$
$$25\% \text{ of } 260 = 0.25 \times 260$$
$$= 65$$

Example 2: Find 175% of 56

Method 1:

Write 175% as a fraction in simplest form.

Use the fraction in a multiplication problem

$$175\% = \frac{175}{100} \text{ or } \frac{7}{4}$$
$$175\% \text{ of } 56 = \frac{7}{4} \times 56$$
$$= \frac{7}{\cancel{4}_1} \times \frac{\cancel{56}^{14}}{1}$$
$$= 98$$

So, 175% of 56 is 98.

Method 2:

Write 175% as a decimal.
Then write a multiplication problem.

$$175\% = 1.75$$
$$175\% \text{ of } 56 = 1.75 \times 56$$
$$= 98$$

Find the percent of each number.

1. 48% of 50

2. 40% of 95

3. 75% of 116

4. 8% of 85

5. 98% of 30

6. 0.3% of 460

7. 15% of 342

8. 350% of 60

NO Calculators! Show work for every problem on separate sheet of paper!

Multiply Decimals by Decimals

When you multiply a decimal by a decimal, multiply the numbers as if you were multiplying all whole numbers. To decide where to place the decimal point, find the sum of the number of decimal places in each factor. The product has the same number of decimal places.

Example 1

Find 5.2 × 6.13.

Estimate: 5 × 6 or 30

5.2 ← one decimal place
× 6.13 ← two decimal places
156
52
+312
31.876 ← three decimal places

The product is 31.876. Compared to the estimate, the product is reasonable.

Example 2

Find 2.3 × 0.02.

Estimate: 2 × 0.02 or 0.04

2.3 ← one decimal place
× 0.02 ← two decimal places
0.046 ← Annex a zero to make three decimal places.

The product is 0.046. Compared to the estimate, the product is reasonable.

Multiply.

1. 7.2 × 2.1

2. 4.3 × 8.5

3. 2.64 × 1.4

4. 14.23 × 8.21

5. 5.01 × 11.6

6. 9.001 × 4.2

7. 3.24 × 0.008

8. 0.012 × 2.9

9. 0.9 × 11.2

NO Calculators! Show work for every problem on separate sheet of paper!

Divide Decimals by Decimals

When you divide a decimal by a decimal multiply both the divisor and the dividend by the same power of ten. Then divide as with whole numbers.

Example 1

Find 10.14 ÷ 5.2.

Estimate: 10 ÷ 5 = 2

Multiply by 10 to make a whole number.

Multiply by the same number, 10.

$$5.2\overline{)10.14} \longrightarrow 52\overline{)101.40}$$

1.95	Place the decimal point.
52)101.40	Divide as with whole numbers.
− 52	
494	
− 468	
260	Annex a zero to continue.
− 260	
0	

10.14 divided by 5.2 is 1.95. Compare the quotient with the estimate.

Check 1.95 × 5.2 = 10.14 ✓

Example 2

Find 4.09 ÷ 0.02.

Multiply each by 100.

$$0.02\overline{)4.09} \longrightarrow 2\overline{)409.0}$$

204.5	Place the decimal point.
2)409.0	Divide.
− 4	
00	
− 0	
09	
− 8	
10	Write a zero in the dividend
− 10	and continue to divide.
0	

4.09 divided by 0.02 is 204.5.

Check 204.5 × 0.02 = 4.09 ✓

Divide.

1. 9.8 ÷ 1.4

2. 4.41 ÷ 2.1

3. 16.848 ÷ 0.72

4. 8.652 ÷ 1.2

5. 0.5 ÷ 0.001

6. 9.594 ÷ 0.06

NO Calculators! Show work for every problem on separate sheet of paper!

Multiply Mixed Numbers

To multiply mixed numbers, write the mixed numbers as improper fractions and then multiply as with fractions.

Example 1

Find $\frac{1}{4} \times 1\frac{2}{3}$.

Estimate. Use compatible numbers. $\frac{1}{2} \times 2 = 1$

$\frac{1}{4} \times 1\frac{2}{3} = \frac{1}{4} \times \frac{5}{3}$ Write $1\frac{2}{3}$ as $\frac{5}{3}$.

$= \frac{1 \times 5}{4 \times 3}$ Multiply.

$= \frac{5}{12}$ Simplify. Compare to the estimate.

Example 2

Find $1\frac{1}{3} \times 2\frac{1}{4}$.

$1\frac{1}{3} \times 2\frac{1}{4} = \frac{4}{3} \times \frac{9}{4}$ Convert mixed numbers to improper fractions.

$= \frac{\overset{1}{\cancel{4}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{3}{\cancel{9}}}{\underset{1}{\cancel{4}}}$ Divide the numerator and denominator by their common factors, 3 and 4.

$= \frac{3}{1}$ or 3 Simplify.

Multiply. Write in simplest form.

1. $\frac{1}{3} \times 1\frac{1}{3}$

2. $1\frac{1}{5} \times \frac{3}{4}$

3. $\frac{2}{3} \times 1\frac{3}{5}$

4. $2\frac{1}{2} \times 1\frac{1}{3}$

Divide Mixed Numbers

To divide mixed numbers express each mixed number as an improper fraction. Then divide as with fractions.

Find $1\frac{2}{3} \div \frac{3}{4}$.

$1\frac{2}{3} \div \frac{3}{4} = \frac{5}{3} \div \frac{3}{4}$ Write the mixed number as an improper fraction.

$= \frac{5}{3} \times \frac{4}{3}$ Multiply by the reciprocal.

$= \frac{20}{9}$ or $2\frac{2}{9}$ Simplify.

Example 2

Find $2\frac{2}{3} \div 1\frac{1}{5}$.

Estimate: $3 \div 1 = 3$

$2\frac{2}{3} \div 1\frac{1}{5} = \frac{8}{3} \div \frac{6}{5}$ Write mixed numbers as improper fractions.

$= \frac{8}{3} \times \frac{5}{6}$ Multiply by the reciprocal, $\frac{5}{6}$.

$= \frac{\overset{4}{\cancel{8}} \times 5}{3 \times \underset{3}{\cancel{6}}}$ Divide 8 and 6 by the GCF, 2.

$= \frac{20}{9}$ or $2\frac{2}{9}$ Simplify. Compare to the estimate

Divide. Write in simplest form.

5. $2\frac{1}{2} \div \frac{4}{5}$

6. $9 \div 1\frac{1}{9}$

7. $2\frac{1}{2} \div 3\frac{1}{3}$

8. $7\frac{1}{2} \div 1\frac{2}{3}$

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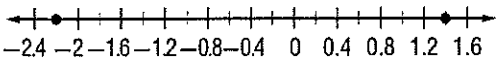
Compare and Order Rational Numbers

You can use a number line to compare and order rational numbers. A number is greater than another number if it is to the right of it.

Example 1

Fill in ◌ in –2.2 ◌ 1.4 with <, >, or = to make a true statement.

Graph the decimals on a number line.



Since –2.2 is to the left of 1.4, $-2.2 < 1.4$.

Example 2

Fill in ◌ in $-\frac{4}{5}$ ◌ $-\frac{2}{3}$ with <, >, or = to make a true statement.

Rename the fractions using the least common denominator.

$-\frac{4}{5} = \frac{4\times3}{5\times3} = -\frac{12}{15}$ $\quad -\frac{2}{3} = \frac{2\times5}{3\times5} = -\frac{10}{15}$

Since –12 is less than –10, $-\frac{12}{15} < -\frac{10}{15}$, and $-\frac{4}{5} < -\frac{2}{3}$.

When comparing fractions and decimals you can write the fraction as a decimal and then compare.

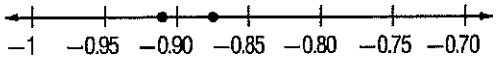
Example 3

Fill in ◌ in –0.91 ◌ $-\frac{7}{8}$ with <, >, or = to make a true statement.

Rename $-\frac{7}{8}$ as a decimal. $-\frac{7}{8} = -0.875$

$-0.91 < -0.875$ because –0.91 is to the left of –0.875 on a number line.

So, $-0.91 < -\frac{7}{8}$.



Fill in ◌ with <, >, or = to make a true statement.

1. –8.6 ◌ –8.64

2. – 7.3 ◌ 6.9

3. $-\frac{3}{7}$ ◌ $-\frac{2}{7}$

4. $-\frac{3}{11}$ ◌ $-\frac{8}{11}$

5. –5.95 ◌ $-5\frac{92}{100}$

6. –12.32 ◌ $-12\frac{8}{25}$

7. $-\frac{3}{4}$ ◌ $-\frac{1}{2}$

8. $-\frac{4}{9}$ ◌ $-\frac{5}{6}$

9. –1.5 ◌ $-\frac{5}{2}$

Powers and Exponents

A product of like factors can be written using a **base**, the number used as a factor, and an **exponent**, which tells how many times the base is used as a factor. Numbers expressed using exponents are called **powers**. For example, 100 and 1,000 are powers of 10 because they can be written 10^2 as and 10^3.

Example 1

Write $4 \times 4 \times 4 \times 4 \times 4$ using an exponent.

$4 \times 4 \times 4 \times 4 \times 4 = 4^5$ 4 is used as a factor five times.

Example 2

Write 3^4 as a product of the same factor. Then find the value.

The base is 3. The exponent is 4. So, 3 is used as a factor four times.

$3^4 = 3 \times 3 \times 3 \times 3$ Write 3^4 as a product.
$= 81$ Multiply.

Exercises
Write each product using an exponent.

1. $4 \times 4 \times 4$

2. $7 \times 7 \times 7 \times 7 \times 7$

3. $9 \times 9 \times 9 \times 9$

4. $8 \times 8 \times 8 \times 8 \times 8 \times 8$

Write each power as a product of the same factor. Then find the value.

5. 5^3

6. 6^2

7. 1.1^4

8. 0.7^3

NO Calculators! Show work for every problem on separate sheet of paper!

Order of Operations

Order of Operations

1. Simplify the expressions inside grouping symbols, like parentheses.
2. Find the value of all powers.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

Example 1

Find the value of $48 \div (3 + 3) - 2^2$.

$48 \div (3 + 3) - 2^2 = 48 \div 6 - 2^2$	Simplify the expression inside the parentheses.
$= 48 \div 6 - 4$	Find 2^2.
$= 8 - 4$	Divide 48 by 6.
$= 4$	Subtract 4 from 8.

Example 2

Find the value of $3 - (6 + 3) \div 3^2$

$3 - (6 + 4) \div 3^2 = 3 - (9) \div 3^2$	Simplify the expression inside the parentheses.
$= 3 - 9 \div 9$	Find 3^2.
$= 3 - 1$	Divide 9 by 9.
$= 2$	Subtract 1 from 3.

Find the value of each expression.

1. $7 + 2 \times 3$

2. $12 \div 3 + 5$

3. $16 - (4 + 5)$

4. $8 \times 8 \div 4$

5. $10 + 14 \div 2$

6. $3 \times 3 + 2 \times 4$

7. $25 \div 5 + 6 \times (12 - 4)$

8. $80 - 8 \times 3^2$

9. $11 \times (9 - 2^2)$

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Solve Addition and Subtraction Equations

You can solve an equation by using inverse operations, which *undo* operations. To solve an addition equation, you would use subtraction. Addition and subtraction are inverse operations. Therefore, you can solve a subtraction equation by adding.

Solve x + 2 = 7

$x + 2 = 7$	Write the equation.
$-2 \quad -2$	Subtract 2 from each side to undo the addition of 2 on the left.
$x = 5$	Simplify.

Check

$x + 2 = 7$	Write the equation.
$5 + 2 \stackrel{?}{=} 7$	Replace x with 5.
$7 = 7$	The sentence is true. ✓

Solve x – 4 = 10

$x - 4 = 10$	Write the equation.
$+4 \quad +4$	Add 4 to each side.
$x = 14$	Simplify.

Check

$x - 4 = 10$	Write the original equation.
$14 - 4 \stackrel{?}{=} 10$	Replace x with 14.
$10 = 10$	The sentence is true. ✓

Solve each equation. Check your solution.

1. $a + 1 = 7$
2. $3 + b = 8$
3. $9 = x + 4$
4. $a - 2 = 3$
5. $b - 1 = 7$
6. $5 = v - 8$

Solve Multiplication and Division Equations

The number by which a variable is multiplied is called the **coefficient**. For example, in the expression $5x$, the coefficient of x is 5. Because multiplication and division undo each other, use division to solve a multiplication equation. Use multiplication to solve division equations.

Solve 2x = 6

$2x = 6$	Write the equation.
$\frac{2x}{2} = \frac{6}{2}$	Divide each side by 2 to undo the multiplication on the left.
$x = 3$	Simplify.

Check

$2x = 6$	Write the original equation.
$2(3) \stackrel{?}{=} 6$	Replace x with 3.
$6 = 6$	The sentence is true. ✓

Solve $\frac{x}{4} = 6$

$\frac{x}{4} = 6$	Write the equation.
$\frac{x}{4}(4) = 6(4)$	Multiply each side by 4 to undo the division on the left.
$x = 24$	Simplify.

Check

$\frac{x}{4} = 6$	Write the original equation.
$\frac{24}{4} \stackrel{?}{=} 6$	Replace x with 24.
$6 = 6$	The sentence is true. ✓

Solve each equation. Check your solution.

7. $5a = 25$
8. $7c = 49$
9. $56 = 7v$
10. $\frac{a}{2} = 4$
11. $\frac{c}{3} = 6$
12. $11 = \frac{w}{6}$

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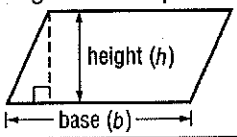
Area of Parallelograms and Triangles

PARALLELOGRAMS

Words The area A of a parallelogram is the product of any base b and its height h.

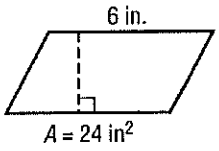
Symbols $A = bh$



Find the height of the parallelogram.

$A = bh$	Area of parallelogram
$24 = 6 \cdot h$	Replace A with 24 and b with 6.
$\frac{24}{6} = \frac{6h}{6}$	Divide each side by 6.
$4 = h$	Simplify.

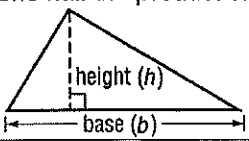
So, the height is 4 inches.



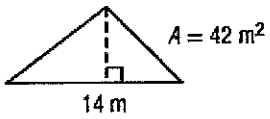
TRIANGLES

Words The area A of a triangle is one half the product of any base b and its height h.

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



Find the area

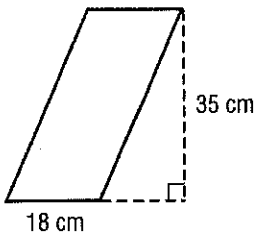


$A = \frac{bh}{2}$	Area of a triangle
$42 = \frac{14 \cdot h}{2}$	Replace A with 42 and b with 14.
$42(2) = \frac{14 \cdot h}{2}(2)$	Multiply both sides by 2.
$84 = 14 \cdot h$	Simplify.
$\frac{84}{14} = \frac{14 \cdot h}{14}$	Divide by 14.
$6 = h$	Simplify.

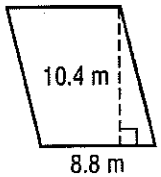
The height is 6 meters.

Find the area of each parallelogram.

1.

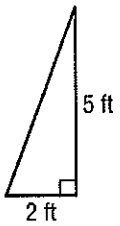


2.



Find the area of each triangle

3.



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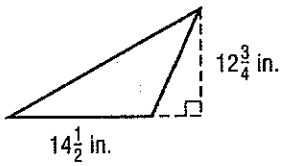
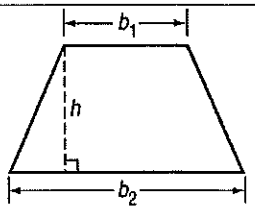


NO Calculators! Show work for every problem on separate sheet of paper!

Area of Trapezoids

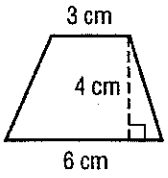
A trapezoid has two bases, $b1$ and $b2$. The height of a trapezoid is the distance between the two bases. The area A of a trapezoid equals half the product of the height h and the sum of the bases b_1 and b_2.

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



Example

Find the area of the trapezoid.

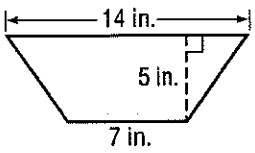


$A = \frac{1}{2}h(b_1 + b_2)$	Area of a trapezoid
$A = \frac{1}{2}(4)(3 + 6)$	Replace h with 4, b_1 with 3, and b_2 with 6.
$A = \frac{1}{2}(4)(9)$	Add 3 and 6.
$A = 18$	Simplify.

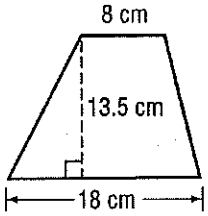
The area of the trapezoid is 18 square centimeters.

Find the area of each figure. Round to the nearest tenth if necessary.

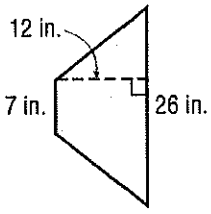
1.



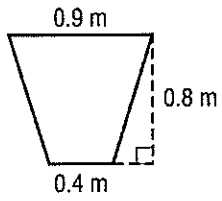
2.



3.

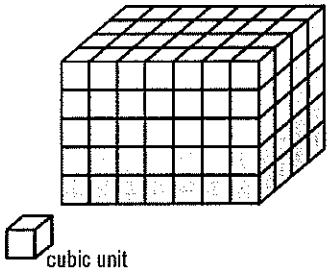


4.



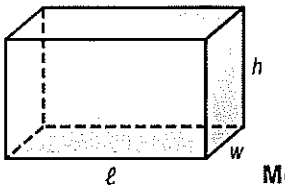
Volume of Rectangular Prisms

The amount of space inside a three-dimensional figure is the **volume** of the figure.
Volume is measured in **cubic units.** This tells you the number of cubes of a given size it will take to fill the prism.



The volume V of a rectangular prism is the product of its length ℓ, width w, and height h.

Symbols $V = \ell wh$



Model

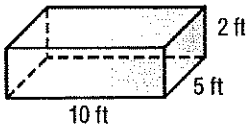
Example
Find the volume of the rectangular prism.

Method 1 Use $V = \ell wh$.

$V = \ell wh$

$V = 10 \times 5 \times 2$

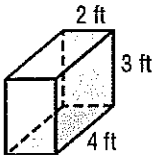
$V = 100$



The volume is 100 ft^3.

Exercises
Find the volume of each prism.

1.



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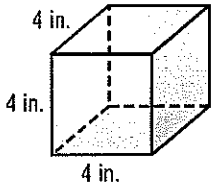

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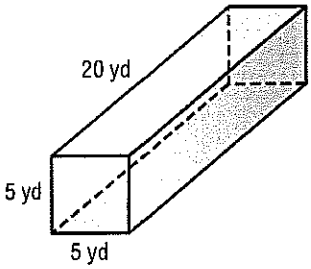

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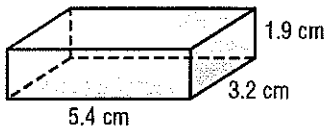


NO Calculators! Show work for every problem on separate sheet of paper!

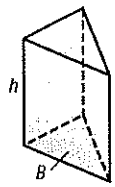
Volume of Triangular Prisms

Volume of a Triangular Prism

Words The volume V of a triangular prism is the area of the base B times the height h.

Symbols $V = Bh$, where $B = \frac{1}{2}bh$

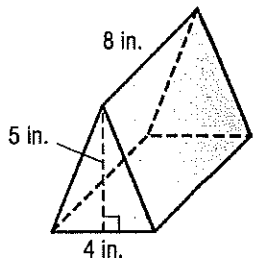
Model



Example 1

Find the volume of the triangular prism.

The area of the triangle is $\frac{1}{2} \cdot 4.5$, so replace B with $\frac{1}{2} \cdot 4 \cdot 5$.

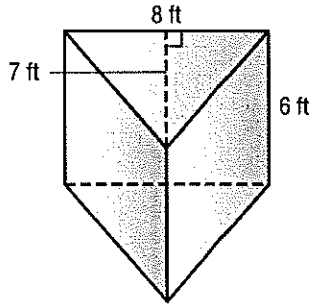


$V = Bh$	Volume of a prism
$V = \left(\frac{1}{2} \cdot 4 \cdot 5\right)(h)$	Replace B with $\frac{1}{2} \cdot 4 \cdot 5$.
$V = \left(\frac{1}{2} \cdot 4 \cdot 5\right)(8)$	Replace h with 8, the height of the prism.
$V = 80$	Multiply.

The volume is 80 cubic inches or 80 in^3.

Example 2

Find the volume of the triangular prism.

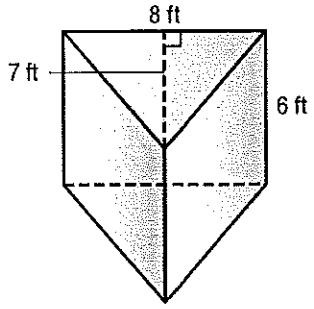


$V = Bh$	Volume of a prism
$V = \left(\frac{1}{2} \cdot 7 \cdot 10\right)(h)$	Replace B with $\frac{1}{2} \cdot 7 \cdot 10$.
$V = \left(\frac{1}{2} \cdot 7 \cdot 10\right)(6)$	Replace h with 6, the height of the prism.
$V = 210$	Multiply.

The volume is 210 cubic centimeters or 210 cm^3.

Find the volume of each prism. Round to the nearest tenth if necessary.

1.



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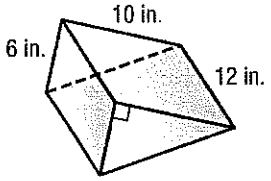

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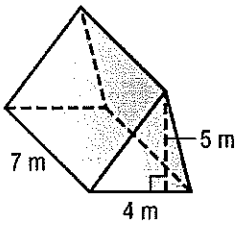
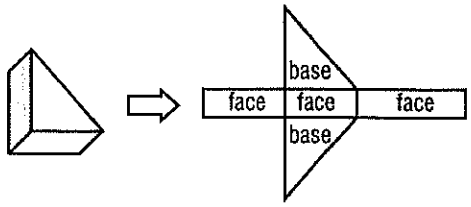


NO Calculators! Show work for every problem on separate sheet of paper!

Surface Area of Triangular Prisms

Words

The surface area of the triangular prism is the sum of the areas of the two triangular bases and the three rectangular faces.



Example 1

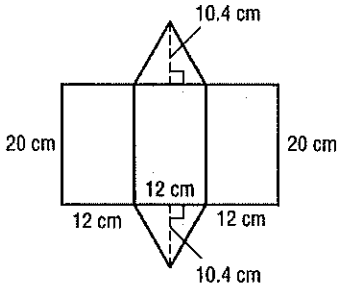
Find the surface area of the triangular prism.

To find the surface area of the triangular prism, find the area of each face and add.

area of each triangular base: $\frac{1}{2}(12)(10.4) = 62.4$

area of each rectangular face: $12(20) = 240$

Add to find the surface area.
$62.4 + 62.4 + 240 + 240 + 240 = 1{,}084.8$ square centimeters



Example 2

Find the surface area of the triangular prism.

Find the area of each face and add. For this prism, each rectangular face has a different area.

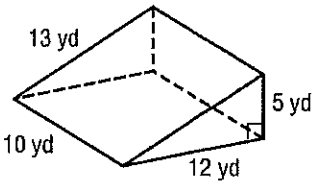
area of each triangular base: $\frac{1}{2}(12)(5) = 30$

area of the rectangular faces: $12(10) = 120$

$5(10) = 50$

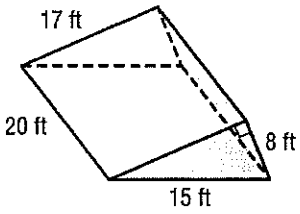
$13(10) = 130$

Add to find the surface area. $30 + 30 + 120 + 50 + 30 = 360$ square yards



Find the surface area of each triangular prism.

1.



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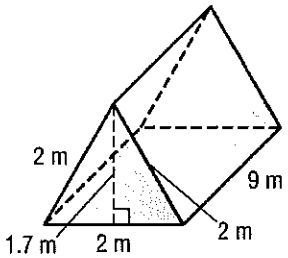


NO Calculators! Show work for every problem on separate sheet of paper!

Measures of Variation and Box Plots

Measures of variation are used to describe the distribution, or spread, of the data. The **range** is the difference between the greatest and least data values. **Quartiles** are values that divide the data set into four equal parts. The median of the lower half of a set of data is the **first quartile** and the median of the upper half of a set of data is the **third quartile.** The difference between the third quartile and the first quartile is called the **interquartile range.**

Example 1

Find the measures of variation for the number of votes received for student government president: 13, 20, 18, 12, 21, 2, 18, 17, 15, 10, and 14.

The greatest number in the data set is 21. The least number is 2. The range is 21 – 2 or 19 votes. To find the quartiles, arrange the numbers in order from least to greatest.

Q1 median Q3

2 10 12 13 14 15 17 18 18 20 21

The interquartile range is 18 – 12 or 6.

A **box plot** is a diagram that is constructed using the median, quartiles, and extreme values. A box is drawn around the quartile values, and the whiskers extend from each quartile to the extreme values.

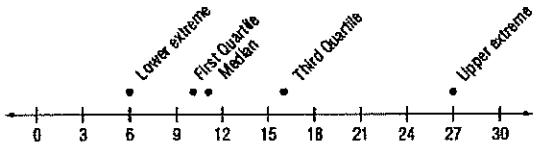
Example 2

The list below shows the number of model airplanes owned by the members of the aviation club. Draw a box plot of the data.

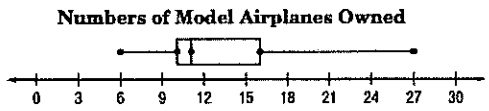
6 ,8, 10, 10, 11, 12, 14, 16, 18, 27

Step 1:Order the number from least to greatest. Then draw a number line that covers the range of the data.

Step 2:Find the median, the extremes, and the first and third quartiles. Mark these points above the number line.



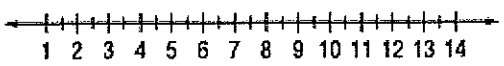
Step 3 – Draw the box so that it includes the quartile values. Draw a vertical line through the median value. Extend the whiskers from each quartile to the extreme data points.

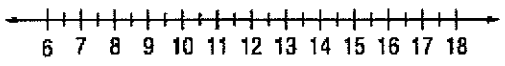


Find the range, median, first and third quartiles, and interquartile range for each data set. Draw a box plot.

1. {4, 7, 5, 3, 12, 6, 5}

2. {13, 8, 17, 10, 6, 11, 18}





NO Calculators! Show work for every problem on separate sheet of paper!

Line Plots and Histograms

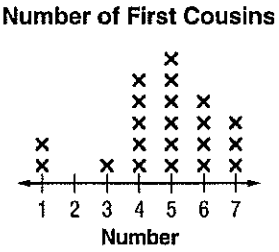
One way to give a picture of data is to make a line plot. A **line plot** is a visual display of a distribution of data values where each data value is shown as a dot or other mark. A line plot is also known as a **dot plot.**

Example 1

FAMILY Students in one class recorded how many first cousins each student had. Here are the results:

Number of First Cousins						
6	5	1	7	3	4	4
5	1	5	5	4	7	5
5	6	7	6	4	6	4

Draw and label a number line that includes the least and greatest data values. Place as many X's above each number as there are responses for that number.



Data from a frequency table can be displayed as a **histogram**, a type of bar graph used to display numerical data that have been organized into equal intervals. These intervals show the **frequency distribution** of the data, or how many pieces of data are in each interval.

Example 2

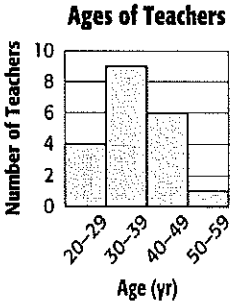
TEACHERS The table shows the ages of teachers at a middle school. Draw a histogram to represent the data.

Step 1 Draw and label a horizontal and vertical axis. Include a title

Step 2 Show the intervals from the frequency table on the horizontal axis. Label the vertical axis to show the frequencies.

Step 3 For each interval, draw a bar whose height is given by the frequencies.

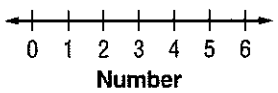
Ages of Teachers		
Age (yr)	Tally	Frequency
20–29	||||	4
30–39	|||| ||||	9
40–49	|||| |	6
50–59	|	1



PHONECALLS For the next month, the fifth-graders kept a record of how many times they called one of their first cousins on the phone. Here are the results: 2, 0, 2, 1, 1, 3, 4, 2, 2, 3, 4, 3, 6, 0, 3, 2, 1, 2, 3, 1, 2

1. Record the results in the line plot below.

2. Create a frequency table and a histogram.



3. How many students made at least one phone call to a first cousin?