HONORS MATH **SUMMER PACKET** **Grade 7**

Dear Honors Math Students and Parents,

This summer, I encourage you to continue to practice your math skills at home. The work I am providing will be a good review of the concepts learned this past school year and will also keep you connected to math.

The skills in your summer packet also serve as prerequisite skills for the math you will learn in the upcoming school year.

Please make sure you follow the suggested directions for the best outcomes:

1. Do NOT use a calculator. Take the time now to practice your math skills.

2. Show all work. If you get an answer incorrect, it helps to go back to your work and find the step that led to your error.

3. Be neat and organized. Part of success in math is being able to organize your work and keep track of your calculations and steps. Use additional paper if necessary.

4. Box your final answers (also an organizational strategy).

5. Do not rush. Spread your work out through the summer.

6. You must complete this math packet instead of the regular math summer packet for your grade!

7. This is due the first week of school when you come to Math class.

Blessings on a fun and safe summer,

Mrs. DiBerardinis

Integer Operations Review

Name: ________________________________

Adding Integers

1) 85 + (-96) = _____
2) 80 + 57 = _____
3) 86 + (-38) = _____
4) 22 + (-41) = _____
5) -18 + (-45) = _____
6) -32 + 48 = _____
7) 6 + (-33) = _____
8) 6 + (-47) = _____
9) (-78) + 69 = _____
10) -72 + (-30) + 10 = _____
11) -83 + (-36) + 20 = _____

Subtracting Integers

1) 1 – 3 = _____
2) 2 – (-5) = _____
3) 6 – (-9) = _____
4) -7 – (-1) = _____
5) -7 – 4 = _____
6) 3 – (-2) = _____
7) -1 –9 = _____
8) 2 – 9 = _____
9) -8 – (-1) = _____

Multiplying Integers

1) (-4)(-12) = _____
2) -8 x (-8) = _____
3) (-8)(-10) = _____
4) 5 x 1 = _____
5) (-10)(11) = _____
6) (-3)(-8) = _____
7) -2 x 6 = _____
8) 7(-12) = _____
9) 4 x (-10) = _____
10) (-9)(-6)(2) = _____
11) (-10)(-7)(-4) = _____

Dividing Integers

1) -48 ÷ 6 = _____
2) -81 ÷ (-9) = _____
3) -18 ÷ (-6) = _____
4) 25 ÷ (-5) = _____
5) -10 ÷ 2 = _____
6) -35 ÷ (-5) = _____
7) -42 ÷ 6 = _____
8) -70 ÷ (-7) = _____
9) -16 ÷ (-8) = _____

Rounding Decimals

Rounding Decimals

Round 8.135 to the nearest tenth.

8.1<u>3</u>5 → 8.1

(3 is less than 5)

Round 32.56713 to the nearest hundredth.

32.56<u>7</u>13 → 32.57

(7 is greater than 5)

Round to the nearest whole number:

1. 41.803
2. 119.63
3. 20.05
4. 3.45
5. 79.531
6. 8.437
7. 29.37
8. 109.96

Round to the nearest tenth:

9. 33.335
10. 1.861
11. 99.96
12. 103.103
13. 16.031
14. 281.05
15. 8.741
16. 27.773

Round to the nearest hundredth:

17. 69.713
18. 5.569
19. 609.906
20. 247.898
21. 5.535
22. 67.1951
23. 14.0305
24. 6.9372

Multiplying and Dividing by 10, 100, etc.

When multiplying by a power of 10, move the decimal to the right:

34.61 x 10 → move 1 place → 346.1

6.77 x 100 → move 2 places → 677

When dividing by a power of 10, move the decimal to the left:

7.39 ÷ 100 → move 2 place → 0.0739

105.61 ÷ 1000 → move 3 places → 0.10561

1. 4.81 × 100 =
2. 37.68 ÷ 10 =
3. 0.46 × 1000 =
4. 7.12 ÷ 10,000 =
5. 5.4 × 10 =
6. 27,500 ÷ 1,000 =
7. 4.395 × 100,000 =
8. 0.0075 ÷ 100 =
9. 2.274 × 10 =
10. 90,000 ÷ 100 =
11. 0.000618 × 1,000 =
12. 39.006 ÷ 1,000 =
13. 16 × 100 =
14. 28.889 ÷ 10,000 =
15. 36.89 × 10,000 =
16. 0.091 ÷ 100 =
17. 0.0336 × 100,000 =
18. 1,672 ÷ 100,000 =

Powers and Exponents

Exponent

$3^4 = \underbrace{3 \cdot 3 \cdot 3 \cdot 3}_{\text{common factors}} = 81$

Base

The **exponent** tells you how many times to use the **base** as a factor.

EXAMPLE 1 **Write 6^3 as a product of the same factor.**

The base is 6. The exponent 3 means that 6 is used as a factor 3 times.

$6^3 = 6 \cdot 6 \cdot 6$

EXAMPLE 2 **Evaluate 5^4.**

$5^4 = 5 \cdot 5 \cdot 5 \cdot 5$

$= 625$

EXAMPLE 3 **Write $4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$ in exponential form.**

The base is 4. It is used as a factor 5 times, so the exponent is 5.

$4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 = 4^5$

Write each power as a product of the same factor (see example 1 above):

1. 7^3
2. 2^7
3. 9^2
4. 15^4

Evaluate each expression (see example 2 above):

5. 3^5
6. 7^3
7. 8^4
8. 5^3

Write each product in exponential form (see example 3 above):

9. $2 \cdot 2 \cdot 2 \cdot 2$
10. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$
11. $10 \cdot 10 \cdot 10$
12. $9 \cdot 9 \cdot 9 \cdot 9 \cdot 9$
13. $12 \cdot 12 \cdot 12$
14. $5 \cdot 5 \cdot 5 \cdot 5$
15. $6 \cdot 6 \cdot 6 \cdot 6 \cdot 6$
16. $1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1$

Order of Operations

Use the **order of operations** to evaluate numerical expressions.

1. Do all operations within grouping symbols first.
2. Evaluate all powers before other operations.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

EXAMPLE 1 **Evaluate $(10 - 2) - 4 \cdot 2$.**

$(10 - 2) - 4 \cdot 2$	$= 8 - 4 \cdot 2$	Subtract first since $10 - 2$ is in parentheses.
	$= 8 - 8$	Multiply 4 and 2.
	$= 0$	Subtract 8 from 8.

EXAMPLE 2 **Evaluate $8 + (1 + 5)^2 \div 4$.**

$8 + (1 + 5)^2 \div 4$	$= 8 + 6^2 \div 4$	First, add 1 and 5 inside the parentheses.
	$= 8 + 36 \div 4$	Find the value of 6^2.
	$= 8 + 9$	Divide 36 by 4.
	$= 17$	Add 8 and 9.

Evaluate each expression.

1. $(1 + 7) \times 3$
2. $28 - 4 \cdot 7$
3. $5 + 4 \cdot 3$
4. $(40 \div 5) - 7 + 2$
5. $35 \div 7(2)$
6. 3×10^3
7. $45 \div 5 + 36 \div 4$
8. $42 \div 6 \times 2 - 9$
9. $2 \times 8 - 3^2 + 2$
10. $5 \times 2^2 + 32 \div 8$
11. $3 \times 6 - (9 - 8)^3$
12. 3.5×10^2

Mixed Numbers

To convert a mixed number, $5\frac{2}{7}$, to an improper fraction, $\frac{37}{7}$:

Numerator

Whole Number → $5\frac{2}{7} = \frac{37}{7}$

Denominator

$5\frac{2}{7}$	Work in a clockwise direction, beginning with the denominator, (7).
$5 \times 7 = 35$	Multiply the denominator (7) by the whole number, (5)
$35 + 2 = 37$	Add that product, (35), to the numerator (2) of the fraction.
$\frac{(5\times 7)+2}{7} = \frac{37}{7}$	The denominator remains the same for the mixed number and the improper fraction.

Convert to Improper Fractions:

1) $4\frac{2}{5} =$

2) $5\frac{3}{8} =$

3) $2\frac{4}{9} =$

4) $5\frac{6}{7} =$

5) $8\frac{1}{8} =$

6) $14\frac{3}{4} =$

7) $6\frac{3}{5} =$

8) $9\frac{1}{10} =$

9) $16\frac{1}{2} =$

10) $8\frac{0}{1} =$

11) $9 =$
Hint: See #10

12) $7\frac{3}{4} =$

13) $12\frac{5}{9} =$

14) $10\frac{3}{8} =$

15) $28\frac{2}{3} =$

Finding Equivalent Fractions with Larger Denominators

This process is sometimes called "**Boosting**"

$$Example: \frac{5}{8} = \frac{?}{56}$$

$56 \div 8 = 7$ — Divide the larger denominator by the smaller to find the factor used to multiply the denominator. (Note: The product of the smaller denominator and the factor is the larger denominator)

$\frac{5}{8} \times \frac{7}{7} = \frac{5 \times 7}{8 \times 7}$ — Use this factor to multiply the numerator.

$\frac{5}{8} = \frac{35}{56}$ — The result is two equivalent fractions.

Note: Equal denominators are required for addition and subtraction of fractions.

Find the equivalent fractions as indicated:

1) $\frac{2}{5} = \frac{\quad}{15}$

2) $\frac{3}{8} = \frac{\quad}{32}$

3) $\frac{4}{9} = \frac{\quad}{54}$

4) $\frac{6}{7} = \frac{\quad}{49}$

5) $\frac{1}{8} = \frac{\quad}{48}$

6) $\frac{3}{4} = \frac{\quad}{44}$

7) $\frac{3}{5} = \frac{\quad}{45}$

8) $\frac{1}{10} = \frac{\quad}{60}$

9) $\frac{1}{2} = \frac{\quad}{28}$

10) $\frac{10}{100} = \frac{\quad}{700}$

11) $\frac{8}{9} = \frac{\quad}{81}$

12) $\frac{3}{4} = \frac{\quad}{68}$

13) $\frac{5}{9} = \frac{\quad}{108}$

14) $\frac{3}{8} = \frac{\quad}{112}$

15) $\frac{2}{3} = \frac{\quad}{462}$

Equivalent Fractions with Smaller Denominators

Reducing Fractions

Example: Reduce the following fraction to lowest terms

$$\frac{90}{105}$$

There are **three** common **methods**, DO NOT mix steps of the methods!

Method 1:

$$\frac{90 \div 15}{105 \div 15} = \frac{6}{7}$$

The Greatest Common Factor for 90 and 105 is 15. Divide the numerator and the denominator by the GCF, 15.

Method 2:

Examine the numerator and denominator for any common factors, divide both numerator and denominator by that common factor. Repeat as needed.

$$\frac{90 \div 5}{105 \div 5} = \frac{18}{21}$$

- Both 90 and 105 are divisible by 5.

$$\frac{18 \div 3}{21 \div 3} = \frac{6}{7}$$

- Both 18 and 21 are divisible by 3.

Method 3:

$$\frac{90}{105} = \frac{2 \times 3 \times 3 \times 5}{7 \times 3 \times 5}$$

Express the numerator and denominator as a product of prime factors.

$$\frac{90}{105} = \frac{2 \times 3 \times (3 \times 5)}{7 \times (3 \times 5)}$$

Divide numerator and denominator by common factors, (3x5)

$$= \frac{2 \times 3}{7} = \frac{6}{7}$$

Multiply remaining factors.

Reduce these fractions.

1) $\frac{28}{50} =$

2) $\frac{8}{24} =$

3) $\frac{30}{54} =$

4) $\frac{18}{42} =$

5) $\frac{32}{48} =$

6) $\frac{36}{54} =$

7) $\frac{14}{56} =$

8) $\frac{18}{28} =$

9) $\frac{36}{216} =$

10) $\frac{35}{42} =$

11) $12\frac{54}{99} =$

12) $15\frac{280}{320} =$

Improper Fractions

Example: Convert $\frac{14}{3}$ to an Improper Fraction

$14 \div 3 = 4$ Remainder 2 — Remember: Dividend $\div$ Divisor = Quotient. Divide the numerator (14) by the denominator (3).

$\frac{14}{3} = 4\frac{2}{3}$ — Write the mixed number in the form: $\textit{Quotient}\,\frac{\textit{remainder}}{\textit{divisor}}$

Note: Check you answer to see if you can reduce the fraction.

Convert these improper fractions to mixed numbers. ***Be sure to reduce when it's possible.***

#11, 12 Hint: how many wholes will there be?

1) $\frac{8}{5} =$

2) $\frac{18}{7} =$

3) $\frac{37}{9} =$

4) $\frac{127}{5} =$

5) $\frac{32}{9} =$

6) $\frac{114}{5} =$

7) $\frac{128}{3} =$

8) $\frac{401}{3} =$

9) $\frac{36}{6} =$

10) $\frac{235}{2} =$

11) $15\,\frac{280}{6} =$

12) $8\,\frac{315}{3} =$

13) $\frac{54}{8} =$

14) $\frac{26}{8} =$

15) $\frac{258}{9} =$

Multiplying Fractions

When multiplying fractions, you multiply the numerators, then multiply the denominators and then reduce if necessary.

EXAMPLE 1 **Find $\frac{3}{8} \cdot \frac{4}{11}$. Write in simplest form.**

$$\frac{3}{8} \cdot \frac{4}{11} = \frac{3}{\overset{}{\underset{2}{\cancel{8}}}} \cdot \frac{\overset{1}{\cancel{4}}}{11}$$ Divide 8 and 4 by their GCF, 4.

$$= \frac{3 \cdot 1}{2 \cdot 11}$$ Multiply the numerators and denominators.

$$= \frac{3}{22}$$ Simplify.

To multiply mixed numbers, first rewrite them as improper fractions.

Multiply and then write in simplest form.

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

2. $\frac{4}{7} \cdot \frac{3}{4}$

3. $\frac{1}{2} \cdot \frac{7}{9}$

4. $\frac{9}{10} \cdot \frac{2}{3}$

5. $\frac{5}{8} \cdot \left(\frac{4}{9}\right)$

6. $\frac{4}{7} \cdot \left(\frac{2}{3}\right)$

** ***Remember to rewrite the mixed numbers as improper fractions before multiplying.***

7. $2\frac{2}{5} \cdot \frac{1}{6}$

8. $3\frac{1}{3} \cdot 1\frac{1}{2}$

9. $3\frac{3}{7} \cdot 2\frac{5}{8}$

10. $1\frac{7}{8} \cdot \left(2\frac{2}{5}\right)$

11. $1\frac{3}{4} \cdot 2\frac{1}{5}$

12. $2\frac{2}{3} \cdot 2\frac{3}{7}$

Dividing Fractions

Two numbers whose product is 1 are **multiplicative inverses**, or **reciprocals**, of each other.

EXAMPLE 1 **Write the multiplicative inverse of $2\frac{3}{4}$.**

$2\frac{3}{4} = \frac{11}{4}$ Write $2\frac{3}{4}$ as an improper fraction.

Since $\frac{11}{4} \bullet \frac{4}{11} = 1$, the multiplicative inverse of $2\frac{3}{4}$ is $\frac{4}{11}$.

To divide by a fraction or mixed number, multiply by its multiplicative inverse.

EXAMPLE 2 **Find $\frac{3}{8} \div \frac{6}{7}$. Write in simplest form.**

$\frac{3}{8} \div \frac{6}{7} = \frac{3}{8} \cdot \frac{7}{6}$ Multiply by the multiplicative inverse of $\frac{6}{7}$, which is $\frac{7}{6}$.

$= \frac{\overset{1}{\cancel{3}}}{8} \cdot \frac{7}{\underset{2}{\cancel{6}}}$ Divide 6 and 3 by their GCF, 3.

$= \frac{7}{16}$ Simplify.

Write the multiplicative inverse of each number:

1. $\frac{3}{5}$
2. $\frac{8}{9}$
3. $\frac{1}{10}$
4. $\frac{1}{6}$
5. $2\frac{3}{5}$
6. $1\frac{2}{3}$
7. $5\frac{2}{5}$
8. $7\frac{1}{4}$

Divide. Write in simplest form:

9. $\frac{1}{3} \div \frac{1}{6}$
10. $\frac{2}{5} \div \frac{4}{7}$
11. $\frac{5}{6} \div \frac{3}{4}$
12. $1\frac{1}{5} \div 2\frac{1}{4}$
13. $3\frac{1}{7} \div 3\frac{2}{3}$
14. $\frac{4}{9} \div 2$
15. $\frac{6}{11} \div 4$
16. $5 \div 2\frac{1}{3}$

Adding and Subtracting Fractions

In order to add fractions, they have to be the same size fractions, meaning they must have a common denominator. To get a common denominator you need to convert the fractions proportionally, multiplying the numerator and denominator by the same value.

EXAMPLE 1 **Find $\frac{3}{5} + \frac{2}{3}$. Write in simplest form.**

$\frac{3}{5} + \frac{2}{3} = \frac{3}{5} \cdot \frac{3}{3} + \frac{2}{3} \cdot \frac{5}{5}$ The LCD is 5 · 3 or 15.

$= \frac{9}{15} + \frac{10}{15}$ Rename each fraction using the LCD.

$= \frac{9 + 10}{15}$ Add the numerators. The denominators are the same.

$= \frac{19}{15}$ or $1\frac{4}{15}$ Simplify.

Add or subtract. Write in simplest form.

1. $\frac{2}{5} + \frac{3}{10}$

2. $\frac{1}{3} + \frac{2}{9}$

3. $\frac{5}{9} - \frac{1}{6}$

4. $\frac{3}{4} - \frac{1}{8}$

5. $\frac{4}{5} + \frac{1}{3}$

6. $1\frac{2}{3} + \frac{4}{9}$

7. $\frac{1}{2} - \frac{3}{10}$

8. $2\frac{1}{4} + 1\frac{3}{8}$

9. $3\frac{3}{4} - 1\frac{1}{3}$

10. $1\frac{1}{5} + 2\frac{1}{4}$

11. $3\frac{1}{3} - 2\frac{4}{9}$

12. $3\frac{3}{5} - 2\frac{2}{3}$

Solving Addition and Subtraction Equations

EXAMPLE 1 **Solve $w + 19 = 45$. Check your solution.**

$w + 19 = 45$	Write the equation.
$w + 19 - 19 = 45 - 19$	Subtract 19 from each side.
$w = 26$	$19 - 19 = 0$ and $45 - 19 = 26$. w is by itself.

Check	$w + 19 = 45$	Write the original equation.
	$26 + 19 \stackrel{?}{=} 45$	Replace w with 26. Is this sentence true?
	$45 = 45$ ✓	$26 + 19 = 45$

EXAMPLE 2 **Solve $h - 25 = -76$. Check your solution.**

$h - 25 = -76$	Write the equation.
$h - 25 + 25 = -76 + 25$	Add 25 to each side.
$h = -51$	$-25 + 25 = 0$ and $-76 + 25 = -51$. h is by itself.

Check	$h - 25 = -76$	Write the original equation.
	$-51 - 25 \stackrel{?}{=} -76$	Replace h with -51. Is this sentence true?
	$-76 = -76$ ✓	$-51 - 25 = -51 + (-25)$ or -76

Solve each equation. Check your solution.

1. $s - 4 = 12$

2. $d + 2 = 21$

3. $h + 6 = 15$

4. $x + 5 = 8$

5. $b - 10 = 34$

6. $f + 22 = 36$

7. $c + 17 = 41$

8. $v - 36 = 25$

9. $y - 29 = 51$

10. $z - 32 = 19$

11. $t + 13 = 29$

12. $k + 39 = 55$

13. $b + 62 = 95$

14. $x - 39 = 65$

15. $n - 47 = 56$

Solving Multiplication and Division Equations

Use the inverse operation to solve for the variable. Multiplication is the inverse of division and vice versa. Remember you should not divide by a fraction, but rather multiply by the multiplicative inverse.

EXAMPLE 1 **Solve $19w = 104$. Check your solution.**

	$19w = 114$	Write the equation.
	$\frac{19w}{19} = \frac{114}{19}$	Divide each side of the equation by 19.
	$1w = 6$	$19 \div 19 = 1$ and $114 \div 19 = 6$.
	$w = 6$	Identity Property; $1w = w$
Check	$19w = 114$	Write the original equation.
	$19(6) \stackrel{?}{=} 114$	Replace w with 6.
	$114 = 114$ ✓	This sentence is true.

EXAMPLE 2 **Solve $\frac{d}{15} = -9$. Check your solution.**

	$\frac{d}{15} = -9$	
	$\frac{d}{15}(15) = -9(15)$	Multiply each side of the equation by 15.
	$d = -135$	
Check	$\frac{d}{15} = -9$	Write the original equation.
	$\frac{-135}{15} \stackrel{?}{=} -9$	Replace d with -135.
	$-9 = -9$ ✓	$-135 \div 15 = -9$

Solve each equation. Show your work. Check your solutions.

1. $\frac{r}{5} = 6$

2. $2d = 12$

3. $7h = 21$

4. $8x = 40$

5. $\frac{f}{8} = 6$

6. $\frac{x}{10} = 7$

7. $6c = 24$

8. $\frac{h}{11} = 12$

9. $12t = 60$

10. $5z = 125$

11. $2t = 28$

12. $11k = 33$

Solving Equations with Rational Numbers

EXAMPLE 1 **Solve $x - 2.73 = 1.31$. Check your solution.**

	$x - 2.73 = 1.31$	Write the equation.
	$x - 2.73 + 2.73 = 1.31 + 2.73$	Add 2.73 to each side.
	$x = 4.04$	Simplify.
Check	$x - 2.73 = 1.31$	Write the original equation.
	$4.04 - 2.73 \stackrel{?}{=} 1.31$	Replace x with 4.04.
	$1.31 = 1.31$ ✓	Simplify.

EXAMPLE 2 **Solve $\frac{4}{5}y = \frac{2}{3}$. Check your solution.**

	$\frac{4}{5}y = \frac{2}{3}$	Write the equation.
	$\frac{5}{4}\left(\frac{4}{5}y\right) = \frac{5}{4} \cdot \frac{2}{3}$	Multiply each side by $\frac{5}{4}$.
	$y = \frac{5}{6}$	Simplify.
Check	$\frac{4}{5}y = \frac{2}{3}$	Write the original equation.
	$\frac{4}{5}\left(\frac{5}{6}\right) \stackrel{?}{=} \frac{2}{3}$	Replace y with $\frac{5}{6}$.
	$\frac{2}{3} = \frac{2}{3}$ ✓	Simplify.

Solve each equation. Check your solutions.

1. $t + 1.32 = 3.48$
2. $b - 4.22 = 7.08$
3. $r - 4.48 = 8.07$
4. $h + \frac{4}{9} = \frac{7}{9}$
5. $x - \frac{1}{4} = \frac{5}{8}$
6. $f - \frac{1}{3} = \frac{3}{5}$
7. $3.2c = 9.6$
8. $1.26d = 5.04$
9. $\frac{3}{5}x = 6$
10. $\frac{3}{4}t = \frac{2}{3}$
11. $\frac{w}{2.5} = 4.2$
12. $1\frac{3}{4}r = 3\frac{5}{8}$

Solving Proportions

A proportion is two fractions that are equivalent. For example, we know that $\frac{1}{2} = \frac{3}{6}$ and we can say that one-half is proportional to three-sixths. You can use cross products to determine if two fractions are proportional.

EXAMPLE 1 **Determine whether the pair of ratios $\frac{20}{24}$ and $\frac{12}{18}$ forms a proportion.**

Find the cross products.

$\frac{20}{24} \stackrel{?}{=} \frac{12}{18}$ $\rightarrow 24 \cdot 12 = 288$
$\rightarrow 20 \cdot 18 = 360$

Since the cross products are not equal, the ratios do not form a proportion.

EXAMPLE 2 **Solve $\frac{12}{30} = \frac{k}{70}$.**

$\frac{12}{30} = \frac{k}{70}$	Write the equation.
$12 \cdot 70 = 30 \cdot k$	Find the cross products.
$840 = 30k$	Multiply.
$\frac{840}{30} = \frac{30k}{30}$	Divide each side by 30.
$28 = k$	Simplify.

The solution is 28.

Determine whether each pair of fractions forms a proportion: (you can use a calculator for this part but show work)

1. $\frac{17}{10}, \frac{12}{5}$	2. $\frac{6}{9}, \frac{12}{18}$	3. $\frac{8}{12}, \frac{10}{15}$
4. $\frac{7}{15}, \frac{13}{32}$	5. $\frac{7}{9}, \frac{49}{63}$	6. $\frac{8}{24}, \frac{12}{28}$
7. $\frac{4}{7}, \frac{12}{71}$	8. $\frac{20}{35}, \frac{30}{45}$	9. $\frac{18}{24}, \frac{3}{4}$

Solve each proportion:

10. $\frac{x}{5} = \frac{15}{25}$

11. $\frac{3}{4} = \frac{12}{c}$

12. $\frac{6}{9} = \frac{10}{r}$

13. $\frac{16}{24} = \frac{z}{15}$

14. $\frac{5}{8} = \frac{s}{12}$

15. $\frac{14}{t} = \frac{10}{11}$

16. $\frac{w}{6} = \frac{2.8}{7}$

17. $\frac{5}{y} = \frac{7}{16.8}$

18. $\frac{x}{18} = \frac{7}{36}$

Fractions, Decimals, and Percent

EXAMPLE 1 **Write 56% as a decimal.**

$56\% = 56\%$ Divide by 100 and remove the percent symbol.

$= 0.56$

EXAMPLE 2 **Write 0.17 as a percent.**

$0.17 = 0.17$ Multiply by 100 and add the percent symbol.

$= 17\%$

EXAMPLE 3 **Write $\frac{7}{20}$ as a percent.**

Method 1 Use a proportion.

$\frac{7}{20} = \frac{x}{100}$ Write the proportion.

$7 \cdot 100 = 20 \cdot x$ Find cross products.

$700 = 20x$ Multiply.

$\frac{700}{20} = \frac{20x}{20}$ Divide each side by 20.

$35 = x$ Simplify.

So, $\frac{7}{20}$ can be written as 35%.

Method 2 Write as a decimal.

$\frac{7}{20} = 0.35$ Convert to a decimal by dividing.

$= 35\%$ Multiply by 100 and add the percent symbol.

NO CALCULATORS!

Write each percent as a decimal: (see example 1 above)

1. 10%
2. 36%
3. 82%
4. 49.1%

Write each decimal as a percent: (see example 2 above)

5. 0.14
6. 0.59
7. 0.932
8. 1.07

Write each fraction as a percent: (see example 3 above)

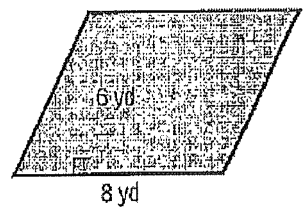
9. $\frac{3}{4}$
10. $\frac{7}{10}$
11. $\frac{9}{16}$
12. $\frac{1}{40}$

Area of Parallelograms, Triangles, & Trapezoids

Formulas:

Area of a Triangle $=\frac{1}{2}bh$ Area of a Parallelogram $= bh$ Area of a Trapezoid $= \frac{1}{2}h(b_1 + b_2)$

EXAMPLES **Find the area of each figure.**

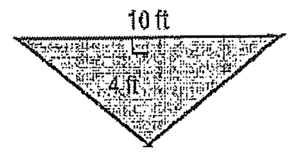


1 The base is 8 yards. The height is 6 yards.

$A = bh$ Area of a parallelogram

$A = 8 \cdot 6$ or 48 Replace b with 8 and h with 6. Multiply.

The area is 48 square yards.

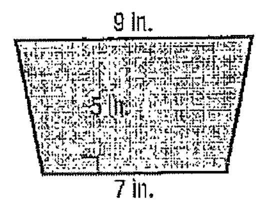


2 The base is 10 feet. The height is 4 feet.

$A = \frac{1}{2}bh$ Area of a triangle

$A = \frac{1}{2} \cdot 10 \cdot 4$ or 20 Replace b with 10 and h with 4. Multiply.

The area is 20 square feet.



3 The height is 5 inches. The lengths of the bases are 9 inches and 7 inches.

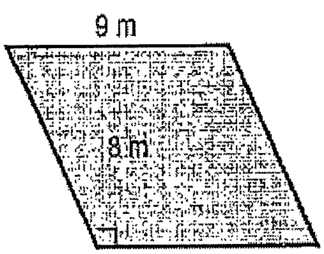
$A = \frac{1}{2}h(b_1 + b_2)$ Area of a trapezoid

$A = \frac{1}{2} \cdot 5 \cdot (9 + 7)$ or 40 Replace h with 5, b_1 with 9, and b_2 with 7. Simplify.

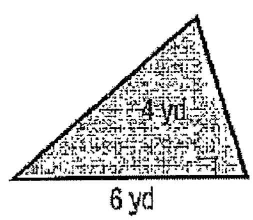
The area is 40 square inches.

Find the area of each figure.

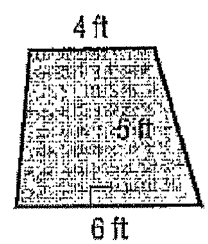
1.



2.



3.



4. parallelogram: base, 11 cm; height, 12 cm

5. triangle: base, 8 mi; height, 13 mi

6. trapezoid: height, 7 km; bases, 8 km and 12 km

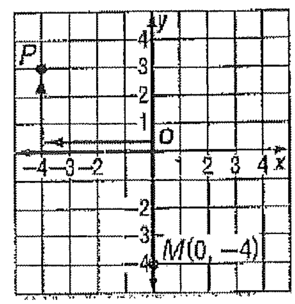
The Coordinate Plane

The **coordinate plane** is used to locate points. The horizontal number line is the ***x*-axis.** The vertical number line is the ***y*-axis.** Their intersection is the **origin.**

Points are located using **ordered pairs.** The first number in an ordered pair is the ***x*-coordinate**; the second number is the ***y*-coordinate.**

The coordinate plane is separated into four sections called **quadrants.**

EXAMPLE 1 **Name the ordered pair for point P. Then identify the quadrant in which P lies.**

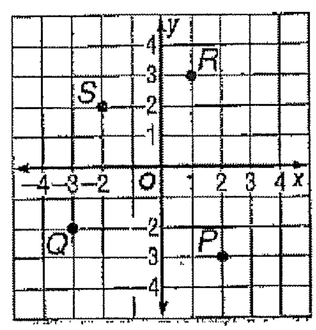


- Start at the origin.
- Move 4 units left along the x-axis.
- Move 3 units up on the y-axis.
  The ordered pair for point P is $(-4, 3)$.
  P is in the upper left quadrant or quadrant II.

EXAMPLE 2 **Graph and label the point $M(0, -4)$.**

- Start at the origin.
- Move 0 units along the x-axis.
- Move 4 units down on the y-axis.
- Draw a dot and label it $M(0, -4)$.

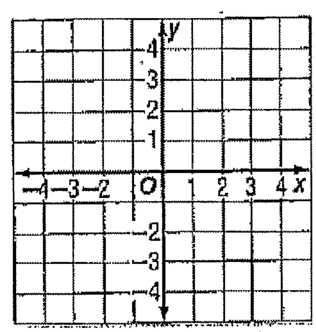
Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.



1. P 2. Q

3. R 4. S

Graph and label each point on the coordinate plane.



5. $A(-1, 1)$ 6. $B(0, -3)$

7. $C(3, 2)$ 8. $D(-3, -1)$

9. $E(1, -2)$ 10. $F(1, 3)$