

Pre-Algebra – Summer Math Packet

On a scale of 1 – 5 (1: Weak, 5: Strong) rate yourself on this section of math: 1 2 3 4 5

Unit: Knowledge of Number Relationships & Computation

Objective: Add, subtract, and multiply positive fractions and mixed numbers. - A

Examples:

- To add unlike fractions (fractions with different denominators), rename the fractions so there is a common denominator.

$$\text{Add: } \frac{1}{6} + \frac{2}{5} = \frac{5}{30} + \frac{12}{30} = \frac{17}{30}$$

$$\text{Add: } 12\frac{1}{2} + 8\frac{2}{3} = 12\frac{1 \cdot 3}{2 \cdot 3} + 8\frac{2 \cdot 2}{3 \cdot 2} = 12\frac{3}{6} + 8\frac{4}{6}$$

$$12\frac{3}{6} + 8\frac{4}{6} = 20\frac{7}{6}$$

$\frac{7}{6}$ is improper so we must change it to proper. 7 divided by 6 = $1\frac{1}{6}$

$$20 + 1\frac{1}{6} = 21\frac{1}{6}$$

1.) Add: $\frac{1}{3} + \frac{1}{9}$

2.) Add: $7\frac{4}{9} + 10\frac{2}{9}$

3.) Add: $1\frac{5}{9} + 4\frac{1}{6}$

4.) Add: $2\frac{1}{2} + 2\frac{2}{3}$

5.) A quiche recipe calls for $2\frac{3}{4}$ cups of grated cheese. A recipe for quesadillas requires $1\frac{1}{3}$ cups of grated cheese. What is the total amount of grated cheese needed for both recipes?

6.) You want to make a scarf and matching hat. The pattern calls for $1\frac{7}{8}$ yards of fabric for the scarf and $2\frac{1}{2}$ yards of fabric for the hat. How much fabric do you need in all?

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Unit: Knowledge of Number Relationships & Computation

Objective: Add, subtract, and multiply positive fractions and mixed numbers. - B

Examples:

- To subtract unlike fractions (fractions with different denominators), rename the fractions so there is a common denominator.

$$\text{Subtract: } \frac{7}{8} - \frac{1}{2} = \frac{7}{8} - \frac{4}{8} = \frac{3}{8}$$

$$\text{Subtract: } 5\frac{3}{4} - 2\frac{1}{3} = 5\frac{9}{12} - 2\frac{4}{12} = 3\frac{5}{12}$$

$$5\frac{9}{12} - 2\frac{4}{12} = 3\frac{5}{12}$$

****Note:** If you have to borrow from the whole number change to improper fractions, find a common denominator, subtract, and then change back to proper fractions.

1.) Subtract: $\frac{9}{10} - \frac{1}{10}$

2.) Subtract: $\frac{2}{3} - \frac{1}{6}$

3.) Subtract: $9\frac{7}{10} - 4\frac{3}{5}$

4.) Subtract: $5\frac{3}{8} - 4\frac{11}{12}$

*Hint: Change to improper fractions first!

5.) Melanie had $4\frac{2}{3}$ pounds of chopped walnuts. She used $1\frac{1}{4}$ pounds in a recipe. How many pounds of chopped walnuts did she have left?

6.) Lois has $3\frac{1}{3}$ pounds of butter. She uses $\frac{3}{4}$ pound in a recipe. How much does she have left? *Hint: Change to improper fractions first.

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Unit: Knowledge of Number Relationships & Computation

Objective: Add, subtract, and multiply positive fractions and mixed numbers. - C

Examples:

- To multiply fractions – Multiply the numerators & denominators.
- Be sure to change mixed numbers to improper fractions before multiplying.

$$\frac{1}{3} \cdot \frac{5}{8} = \frac{5}{24}$$

$$1\frac{1}{3} \cdot 3\frac{2}{5} = \frac{4}{3} \cdot \frac{17}{5} = \frac{68}{15} = 4\frac{8}{15}$$

****Remember:** Changing mixed numbers to improper fractions. $2\frac{3}{4} = 4 \cdot 2 + 3 = \frac{11}{4}$

$$1\frac{1}{3} \cdot 21 = \frac{4}{3} \cdot \frac{21}{1} = \frac{4 \cdot 21}{3 \cdot 1} = \frac{84}{3} = 28$$

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

2.) $\frac{7}{3} \cdot 4\frac{1}{2} =$

3.) $2\frac{1}{2} \cdot 2\frac{1}{3} =$

4.) $3 \cdot 5\frac{2}{9} =$

5.) Anna wants to make 4 sets of curtains. Each set requires $5\frac{1}{8}$ yards of fabric. How much fabric does she need?

6.) One sixth of the students at a local college are seniors. The number of freshmen students is $2\frac{1}{2}$ times that amount. What fraction of the students are freshmen?

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Unit: Knowledge of Number Relationships & Computation

Objective: Determine equivalent forms of rational numbers expressed as **fractions**, decimals, **percents**, and **ratios**.- B

Examples:

A **RATIO** is a comparison of two numbers by division. When a ratio compares a number to 100, it can be written as a **PERCENT**. To write a ratio or fraction as a percent, find an equivalent fraction with a denominator of 100. You can also use the meaning of percent to change percents to fractions.

Write $\frac{19}{20}$ as a percent.

$$\frac{19}{20} \cdot \frac{5}{5} = \frac{95}{100} = 95\% \quad \text{Since } 100 \div 20 = 5, \text{ multiply the numerator and denominator by 5.}$$

Write 92% as a fraction in simplest form.

$$\frac{92}{100} = \frac{\div 4}{\div 4} = \frac{23}{25}$$

Write 92% as a decimal. Move decimal two places to the left. Add zeros if needed. 92.0% = 0.92

Write 0.4 as a percent. Move decimal two places to the right. Add zeros if needed. 0.4 = 40%

1.) Write $\frac{7}{25}$ as a percent and decimal.

2.) Write 19% as a decimal and fraction in simplest form.

3.) Write $\frac{9}{50}$ as a percent and decimal.

4.) Write 75% as a decimal and fraction in simplest form.

5.) Ms. Crest surveyed her class and found that 15 out of 30 students brushed their teeth more than twice a day. Write this ratio as a fraction in simplest form, then write it as a % and a decimal.

6.) A local retail store was having a sale and offered all their merchandise as a 25% discount. Write this percent as a fraction in simplest form, then write it as a decimal.

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Pre-Algebra – Summer Math Packet

Unit: Knowledge of Number Relationships & Computation

Objective: Compare, order, and describe rational numbers.

Examples:

- RATIONAL** numbers include fractions, decimal, and percents. To **COMPARE** or **ORDER** rational numbers, they must be in the same form (all fraction or all decimals, or all %s)

Example: Order 0.6, 48%, and $\frac{1}{2}$ from least to greatest.

Step 1 – Change all to decimals. 0.6 48% = 0.48 $\frac{1}{2} = 0.5$

Step 2 – Compare decimals & Order. 0.48, 0.5, 0.6

Step 3 – Write using original form. 48%, $\frac{1}{2}$, 0.6

1.) Order from least to greatest.

22%, 0.3, $\frac{1}{5}$

2.) Order from least to greatest.

0.74, $\frac{3}{4}$, 70%

3.) Replace with <, >, or =.

$\frac{7}{12}$ 58%

4.) Which is the largest?

$1\frac{3}{8}$ $1\frac{3}{10}$ $1\frac{4}{9}$

5.) According to the Pet Food Manufacturer's Association, 11 out of 25 people own large dogs and 13 out of 50 medium dogs. Do more fraction of people own large or medium dogs?



6.) Your PE teacher asked you to run for specific time period. You ran 0.6 of the time. Two of your friends ran $\frac{7}{10}$ and 72% of the time. Order the amount of time you and your friends ran from least to greatest.

Pre-Algebra – Summer Math Packet

Unit: Knowledge of Geometry

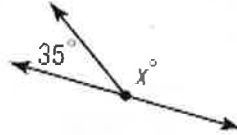
Objective: Determine the measure of angles formed by intersecting lines, line segments, and rays.

Example 1: Find the value of x in the figure.

The two angles are supplementary, so the sum of their measures is 180° .

$$\begin{array}{r} x + 35 = 180 \\ - 35 \quad - 35 \\ \hline x = 145 \end{array}$$

Write the equation
Subtract 35 from both sides
Simplify
The angle is 145°

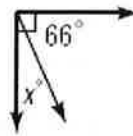


Example 2: Find the value of x in the figure.

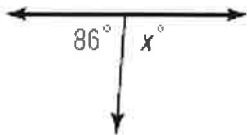
The two angles are complementary, so the sum of their measures is 90° .

$$\begin{array}{r} x + 66 = 90 \\ - 66 \quad - 66 \\ \hline x = 24 \end{array}$$

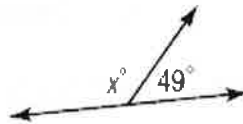
Write the equation
Subtract 66 from both sides
Simplify
The angle is 24°



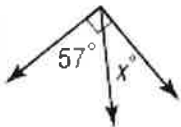
1.) Find the value of x .



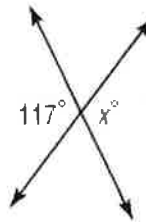
2.) Find the value of x .



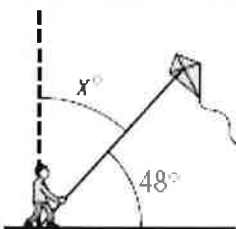
3.) Find the value of x .



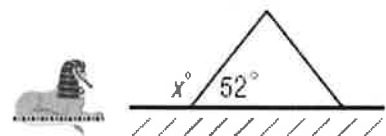
4.) Find the value of x .



5.) A kite string makes an angle of 48° with respect to the ground as shown below. The dashed line is vertical and the ground is horizontal. How are the 48° angle and the unknown angle related? What is the value of x ?



6.) A side view of the Great Pyramid at Giza is shown below. The sides of the pyramid make an angle of 52° with respect to the ground. What is the value of x ?



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Pre-Algebra – Summer Math Packet

Unit: Knowledge of Algebra, Patterns, and Functions

Objective: Apply given formulas to a problem-solving situation using formulas having no more than three variables.

Example 1:

The perimeter of a rectangle is twice the length (L) plus twice the width (W). $P = 2L + 2W$

Use the given formula to find the perimeter of the rectangle.



10 cm

$$P = 2L + 2W$$

$$P = 2(10) + 2(8)$$

$$P = 20 + 16$$

$$P = 36 \text{ cm}$$

Write the equation

Replace L and W with the length and width

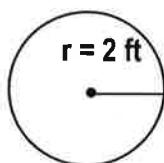
Multiply

Simplify and add the correct label

Example 2:

The area A of a circle equals the product of pi (π) and the square of its radius (r). $A = \pi r^2$ ($\pi \approx 3.14$)

Use the given formula to find the area of the circle.



$$A = \pi r^2$$

$$A = 3.14 \cdot (2)^2$$

$$A = 3.14 \cdot 4$$

$$A = 12.56 \text{ ft}^2$$

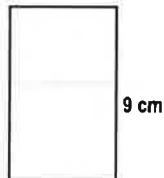
Write the equation

Replace π with 3.14 and r with 2

Square the 2

Simplify and add the correct label

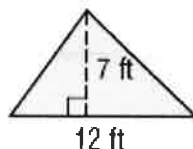
- 1.) The formula for finding the area of a rectangle is $A = L \cdot W$. Use this formula to find the area of the rectangle.



4 cm

- 2.) The formula for finding the area of a triangle is

$$A = \frac{1}{2}bh. \text{ Find the area of the triangle below.}$$



12 ft

- 3.) A trapezoid has two bases (b_1 and b_2). The formula for finding the area of a trapezoid is: $A = \frac{1}{2}h(b_1 + b_2)$

$b_1 = 8 \text{ cm}$

Find the area of the trapezoid.



$b_2 = 18 \text{ cm}$

- 4.) The formula for finding the volume of a rectangular prism is $V = L \cdot W \cdot H$. Find the volume of the box.

$L = 12 \text{ in.}$



$H = 7 \text{ in.}$

$W = 5 \text{ in.}$

- 5.) Margot planted a rectangular garden that was 18 feet long and 10 feet wide. How many feet of fencing will she need to go all the way around the garden? $P = 2L + 2W$

- 6.) Juan ran all the way around a circular track one time. The diameter (d) of the track is 60 meters. The formula for circumference of a circle is $C = \pi d$. Use this formula to find out how far Juan ran.

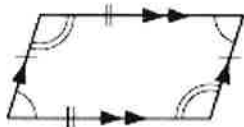
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Unit: Knowledge of Geometry

Objective: Determine a missing angle using the sum of the interior angles in a quadrilateral

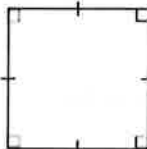
Examples of Quadrilaterals:



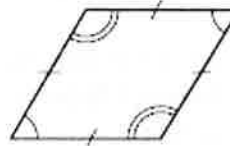
Parallelogram



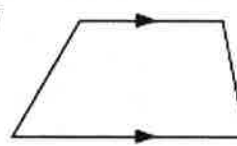
Rectangle



Square



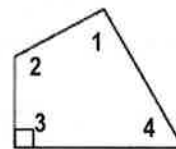
Rhombus



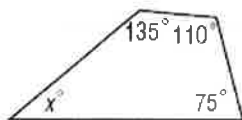
Trapezoid

The sum of the measures of the angles of a quadrilateral is 360° .

$$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 = 360^\circ$$



Example: Find the missing measure in the quadrilateral.



$$135 + 110 + 75 + x = 360$$

$$320 + x = 360$$

$$\begin{array}{r} 320 + x = 360 \\ - 320 \quad - 320 \\ \hline x = 40 \end{array}$$

$$x = 40$$

The sum of the measures is 360°

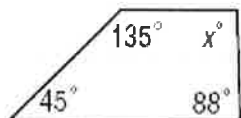
Simplify

Subtract 320 from each side

The missing angle is 40°

Find the missing measure in each of the following quadrilaterals.

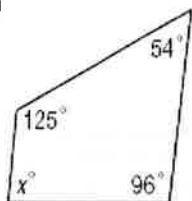
1.)



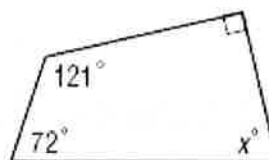
2.)



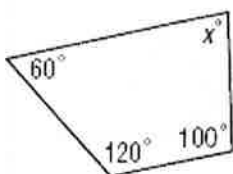
3.)



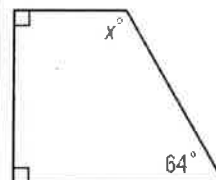
4.)



5.) The top of Mrs. Hartsock's coffee table is shown below.
Find the measure of the missing angle.



6.) Maria needs to cut a piece of carpet to fit the space drawn below. What should the measure of the missing angle be?



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