Presbyterian Christian School

6th Grade Math
Mr. Johnson · Mrs. Walters

Over the summer, we hope each student will retain the skills, knowledge, and content mastered during 5th Grade Math. This math packet is not mandatory but is meant to review, reinforce, and enrich the topics introduced this year. Our desire is for every student to be prepared and ready to succeed in 6th Grade Math!

_Students who complete this packet and turn it in by Friday, August 11th, will receive 10 bonus points on their first test._
Adding and Subtracting Decimals

Find $1.7 + 2.45$.

\[
\begin{array}{c}
1.7 \\
+ 2.45 \\
\hline
4.15
\end{array}
\]

Find $36.57 - 4.6$.

\[
\begin{array}{c}
36.57 \\
- 4.6 \\
\hline
31.97
\end{array}
\]

Find each sum or difference.

\begin{align*}
1. & \quad 2.65 \\
+ & \quad 13.30 \\
\hline
\end{align*}

\begin{align*}
2. & \quad 14.10 \\
- & \quad 3.05 \\
\hline
\end{align*}

\begin{align*}
3. & \quad 7.44 \\
+ & \quad 3.62 \\
\hline
\end{align*}

\begin{align*}
4. & \quad 9 \\
- & \quad 0.6 \\
\hline
\end{align*}

\begin{align*}
5. & \quad 8.97 \\
+ & \quad 6.6 \\
\hline
\end{align*}

\begin{align*}
6. & \quad 100 \\
- & \quad 0.22 \\
\hline
\end{align*}

\begin{align*}
7. & \quad 6.8 \\
+ & \quad 237.29 \\
\hline
\end{align*}

\begin{align*}
8. & \quad 0.5 \\
- & \quad 0.23 \\
\hline
\end{align*}

\begin{align*}
9. & \quad 15.4 - 8 = \underline{7.4} \\
10. & \quad 3 - 2.54 = \underline{0.46} \\
\end{align*}

\begin{align*}
11. & \quad 1.34 + 4.1 = \underline{5.44} \\
12. & \quad 133.01 - 5.6 = \underline{127.41} \\
\end{align*}

\begin{align*}
13. & \quad 448 + 1.75 + 80.3 = \underline{530.05} \\
14. & \quad 12.3 + 0.61 + 100 = \underline{113.91} \\
\end{align*}

15. On the 3-days of their vacation, the Davis family traveled 417 mi, 45.3 mi, and 366.9 mi. How far did they travel all together?

16. Etta bought a calculator for $15. Glenn found the same model for $9.79. How much more did Etta pay than Glenn did?
Ratio and Proportion

You can use ratios to compare two quantities.

2 balloons to 3 sticks

You can write ratios as:
- words: 2 to 3
- with a colon: 2:3
- as a fraction: \( \frac{2}{3} \)

A statement that two ratios are equal is called a proportion.

\[ \frac{1 \text{ balloon}}{2 \text{ sticks}} = \frac{2 \text{ balloons}}{4 \text{ sticks}} \]

\[ \frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4} \]

\[ \frac{1}{2} = \frac{2}{4} \text{ is a proportion.} \]

Write each ratio. Use words, a colon, or a fraction.

1. Write the ratio of squares to circles.

\[ \square \square \square \square \]

\[ \bigcirc \bigcirc \bigcirc \bigcirc \]

2. The Computer Club has 20 girls and 15 boys. Write the ratio of girls to boys in the club.

Tell if the ratios form a proportion. Write yes or no.

3. \( \frac{3}{4} \quad \frac{9}{12} \)    4. \( \frac{1}{3} \quad \frac{2}{9} \)    5. \( \frac{3}{5} \quad \frac{6}{10} \)    6. \( \frac{4}{6} \quad \frac{8}{18} \)

Complete each table so that all ratios are equal.

7. \[
\begin{array}{cccc}
3 & 6 & 9 & 12 \\
5 & \text{ } & \text{ } & \text{ }
\end{array}
\]

8. \[
\begin{array}{cccc}
2 & \text{ } & \text{ } & \text{ }
7 & 21 & 42 & 63
\end{array}
\]

9. \[
\begin{array}{cccc}
4 & 20 & \text{ } & \text{ }
5 & 10 & 50 & \text{ }
\end{array}
\]

10. The ratio of the width to the length of a painting is 3 to 7. If the painting is 42 in. long, how wide is it?

11. The ratio of the number of moons the planet Neptune has to the number that Saturn has is 4 to 9. Saturn has 18 moons. How many moons does Neptune have?
Area of Squares and Rectangles

You can use formulas to find the area of a square or rectangle.

Find the area of a square that is 7.2 m on each side.

Use the formula $A = s^2$.

$A = (7.2)^2$
$A = 51.84$

The area is 51.84 $m^2$.

Find the area of a rectangle with a length ($l$) of 4 cm and a width ($w$) of 12 cm.

Use the formula $A = l \times w$.

$A = 4 \times 12$
$A = 48$

The area is 48 $cm^2$.

Find the area of each figure.

1. 

2.

3. 

4.

5. **Reasoning** What is the length of a rectangle that has an area of 120 $ft^2$ and a width of 8 ft?

6. **Number Sense** What is the area of a square that is 12.4 cm on each side?
Dividing with Decimals

Find $36.8 \div 16$.

$$
\begin{array}{c}
16)36.8 \\
\underline{32} \\
48 \\
\underline{48} \\
0
\end{array}
$$

Place the decimal point.

Multiply $2 \times 16$.
Subtract. Bring down 8.

Try 2 in the quotient.

Multiply $3 \times 16$.
Subtract.

Find each quotient.

1. $6)3.8$
2. $6)31.4$
3. $9)41.3$
4. $5)88.5$
5. $7)66.92$
6. $28)263.2$
7. $41)274.7$
8. $7)44.23$

9. $269.12 \div 8 = \phantom{0}\phantom{0}$
10. $311.56 \div 4 = \phantom{0}\phantom{0}$

11. $2229.62 \div 46 = \phantom{0}\phantom{0}$
12. $1449.09 \div 81 = \phantom{0}\phantom{0}$

13. A photographer bought 36 rolls of film for $136.44. What was the price of one roll?

14. Four students each ran 100 m in a 400-m relay race. The team's total time was 49.44 sec. Find the average time of each runner.
Multiplying with Decimals

Find $4.3 \times 2.7$.

<table>
<thead>
<tr>
<th>Multiply as you would with whole numbers.</th>
<th>Count the number of decimal places in both factors. The total is the number of decimal places in the product.</th>
</tr>
</thead>
</table>
| $\begin{array}{c}
2 \\
4.3 \\
\times 2.7 \\
\hline
301 \\
860 \\
\hline
1161
\end{array}$ | $\begin{array}{c}
4.3 \ + \ 1 \text{ decimal place} \\
\times 2.7 \ + \ 1 \text{ decimal place} \\
\hline
11.61 \ + \ 2 \text{ decimal places}
\end{array}$ |

Find each product.

1. $1.4 \times 8.8 = 11.20$
2. $1.6 \times 9 = 14.4$
3. $0.4 \times 3.2 = 1.28$
4. $0.05 \times 0.3 = 0.015$
5. $2.15 \times 8.3 = 17.755$
6. $3.3 \times 0.12 = 0.396$
7. $0.51 \times 4.2 = 2.142$
8. $1.35 \times 13 = 17.55$
9. $23 \times 0.47 = 10.81$
10. $0.9 \times 5 = 4.5$
11. $168 \times 2.25 = 378$
12. $0.8 \times 0.11 = 0.088$
13. $20 \times 20.2 = 404$
14. $4.9 \times 0.3 = 1.47$

15. A roll of paper towels contained 250 sheets. Each sheet was 8.75 inches long. How long was the roll?

Adding and Subtracting Fractions

Add or subtracting the fractions and mixed numbers. Reduce your answer when possible.

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

2.) $3 \frac{3}{4} - \frac{1}{4}$

3.) $\frac{7}{8} - \frac{5}{8}$

4.) $\frac{1}{6} + 2 \frac{5}{6}$

5.) $1 \frac{2}{3} - \frac{2}{3}$

6.) $3 \frac{5}{7} + \frac{2}{7}$

7.) $1 - \frac{2}{5}$

8.) $\frac{1}{4} + \frac{1}{4}$

9). If Jonathan has 15 inches of yard and used 10 inches of it on an art project; how what fraction of the yarn did he use?

10). For a recipe, Gabby needs 1 cup of flour. If she has one-third of a cup, how much more does she need?
Multiplying Mixed Numbers

- **Step 1:** Make the mixed number an improper fraction
  *Multiply the denominator by the whole number FIRST, then add that product to the numerator. Place it over the denominator. (Keep the denominator the same.)*

  \[
  \frac{3\frac{2}{3}}{4\frac{1}{2}} = \frac{11}{3} \times \frac{9}{2}
  \]

- **Step 2:** Look for common factors and simplify: \(\frac{11}{3} \times \frac{9}{2}\)

- **Step 3:** Multiply across. Write product as a mixed number: \(\frac{33}{2} = 16\frac{1}{2}\)

1.) \(2\frac{2}{5} \times 3\frac{2}{3}\)  

2.) \(1\frac{3}{7} \times 4\frac{2}{5}\)

3.) \(2\frac{2}{9} \times 2\frac{1}{2}\)  

4.) \(1\frac{3}{4} \times 1\frac{1}{2}\)

5.) \(10\frac{2}{5} \times 1\frac{1}{5}\)  

6.) \(2\frac{1}{4} \times 1\frac{1}{3}\)
Fractions, Decimals, and Percents

Fractions, decimals, and percents all name parts of a whole. The grid to the right has 72 out of 100 squares shaded.

72 out of 100 are shaded. As a fraction, that is \( \frac{72}{100} \).

As a decimal, that is 0.72. As a percent, that is 72%.

Write 40% as a fraction and decimal.

\[ 40\% = \frac{40}{100} = 0.40 \]

The decimal point moves two places to the left.

Write 0.47 as a fraction and percent.

\[ 0.47 = \frac{47}{100} = 47\% \]

Write 0.3% as a fraction and decimal.

\[ 0.3\% = \frac{0.3}{100} = 0.003 \]

The decimal point moves two places to the left. Fill in any spaces with zeros.

Write \( \frac{3}{4} \) as a decimal and percent.

You can use a proportion:

\[ \frac{3}{4} = \frac{n}{100} \]

\[ \frac{4n}{4} = \frac{300}{4} \]

\[ n = 75 \]

So, \( \frac{3}{4} = 0.75 = 75\% \).

Write each in two other ways.

1. \( \frac{2}{10} \) _________; _________

2. \( \frac{23}{100} \) _________; _________

3. \( \frac{7}{10} \) _________; _________

4. 97% _________; _________

5. 16% _________; _________

6. 52% _________; _________

7. 0.04 _________; _________

8. 0.35 _________; _________

9. **Number Sense** Sheila got 87% of the problem correct.
   Patrick got \( \frac{91}{100} \) correct. Who scored higher?
Multiplying Fractions

Find \( \frac{3}{4} \times \frac{2}{7} \).

**One Way**

Draw a picture. Simplify if possible.

\[
\begin{array}{c}
\frac{3}{4} \\
\frac{2}{7} \\
\hline
6 \text{ of the 28 squares have overlapping shading.}
\end{array}
\]

So, \( \frac{3}{4} \times \frac{2}{7} = \frac{6}{28} \).

Simplify \( \frac{6}{28} \) to \( \frac{3}{14} \).

**Another Way**

Multiply the numerators and denominators. Simplify if possible.

\[
\begin{align*}
\frac{3}{4} \times \frac{2}{7} &= \frac{3 \times 2}{4 \times 7} = \frac{6}{28} \\
&= \frac{3}{14}
\end{align*}
\]

**Simplify First**

Find the GCF of any numerator and any denominator.

The GCF of 2 and 4 is 2. Divide 2 and 4 by the GCF.

\[
\frac{3 \times \frac{1}{2}}{\frac{2}{7}} = \frac{3}{14}
\]

Write an equation for each picture.

1.

2.

Find each product. Simplify if possible.

3. \( \frac{6}{8} \times \frac{1}{3} = \) 4. \( \frac{5}{6} \times \frac{7}{10} = \)

5. \( \frac{4}{5} \times \frac{3}{8} = \) 6. \( \frac{1}{2} \times \frac{4}{9} = \)

7. **Number Sense** Can you simplify before multiplying \( 14 \times \frac{25}{27} \)? Explain.
Perimeter

Perimeter is the distance around a shape.

You can add the lengths of all the sides or you can multiply the sum of the length and the width by 2 to find the perimeter of a rectangle.

25 in.
9 in.

\[ p = 25 \text{ in.} + 9 \text{ in.} = 34 \text{ in.} \]

or \[ p = 2 \times (25 \text{ in.} + 9 \text{ in.}) = 68 \text{ in.} \]

If only one side of a figure is given, then all sides have the same length.

5 cm

\[ p = 5 \text{ cm} + 5 \text{ cm} + 5 \text{ cm} + 5 \text{ cm} = 20 \text{ cm} \]

or \[ p = 4 \times 5 \text{ cm} = 20 \text{ cm} \]

1. Find the perimeter of the rectangle.

2. Find the perimeter of the square.

\[ p = \_\_ + \_\_ + \_\_ + \_\_ = \_\_ \text{ m} \]

\[ p = \_\_ \times \_\_ = \_\_ \text{ in.} \]

Find the perimeter of each figure.

3. \[ \text{3 ft} \]

4. \[ \text{2 m} \]

5. \[ \text{12 in.} \]

6. \[ \text{4.5 yd} \]

7. \[ \text{2 \frac{1}{4} in.} \]

8. \[ \text{20 cm} \]

9. \[ \text{4 in.} \]

10. \[ \text{8 m} \]

11. A flower garden is in the shape of an equilateral triangle.

Each side measures \(15\frac{3}{8}\) ft. What is the garden's perimeter?