

7th Grade

Math Summer Packet

Name: _____

Greetings 7th Grade students,

Welcome to 7th Grade! We are looking forward to learning with you next school year.

In order to be prepared for math class, it is important to review topics from previous mathematics grade levels. The problems in this packet are designed to help you review and maintain the necessary skills to be a successful 7th Grade math student.

Make sure to follow the directions below for the best outcomes:

1. Do NOT use a calculator.
2. Show all work! An important aspect of mathematics is being able to communicate the process you use to arrive at your answer.
3. Be neat and organized! Part of success in math is being able to organize your work.
4. Box your final answers.
5. Do not rush! Take advantage of the summer pace.

This will be collected within the first week of school.

Have a wonderful summer!

7th Grade Math Teachers

***If you are struggling with any of the skills in this packet, please search for the skill topic on Khan Academy website: <https://www.khanacademy.org/> or the Virtual Nerd website: <http://virtualnerd.com/pre-algebra/all/>. You can also get extra practice on each skill from the IXL website. [ixl.com](http://www.ixl.com). You can complete 10 questions a day without a membership.



Decimal and Fraction Operations

Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.
2. Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.
3. Add/subtract as if the numbers are whole numbers
4. Bring the decimal point straight down

ex: $14.2 - 7.934$

$$\begin{array}{r} 14.200 \\ - 7.934 \\ \hline 6.266 \end{array}$$

Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimal points do NOT need to be lined up.
2. Ignore the decimals and multiply as if the numbers are whole numbers.
3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has that same number of decimal places.

ex: 6.94×7.8

$$\begin{array}{r} 6.94 \rightarrow 2 \text{ decimal places} \\ \times 7.8 \rightarrow 1 \text{ decimal place} \\ \hline 5552 \\ + 48580 \\ \hline 54132 \end{array}$$

3 decimal places

$\boxed{54.132}$

Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.
2. Move the decimal point in the divisor after the number to turn it into a whole number and then move the decimal in the dividend the same number of places. Then bring it up.
3. Divide as if the numbers are both whole numbers.
4. Annex zeros in the dividend as needed until there is no remainder. If your answer is a repeating decimal, write the answer using bar notation.

ex: $25.3 \div 0.3$

$$\begin{array}{r} \boxed{84.\bar{3}} \\ 0.3 \overline{) 25.30} \\ \underline{-24} \\ 13 \\ \underline{-12} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

Order of Operations

1. Grouping Symbols (parentheses, brackets, etc.)
2. Exponents
3. Multiplication & Division (left to right)
4. Addition & Subtraction (left to right)

ex: $5 + 4(3 - 1.2)$

$$5 + 4(1.8)$$

$$5 + 7.2$$

$$\boxed{12.2}$$

Evaluate each expression.

1. $5.983 + 2.99$	2. $224 - 56.73$	3. $6.12 - 4.923$
4. $24.5 \cdot 3.2$	5. $0.23 \cdot 7$	6. $3.86 \cdot 9.15$
7. $14.8 \div 5$	8. $46.3 \div 1.5$	9. $147 \div 2.25$
10. $24.33 - 2.5 \cdot 7$	11. $3.9 + 4.5^2$	12. $9.25(18.4 - 2 \cdot 1.2)$

Adding Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.
2. Add the two numerators and keep the denominator the same.
3. Add the whole numbers.
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $3\frac{3}{4} + 2\frac{1}{2}$

$$\begin{array}{r} 3\frac{3}{4} = 3\frac{3}{4} \\ + 2\frac{1}{2} = 2\frac{2}{4} \\ \hline 5\frac{5}{4} = 6\frac{1}{4} \end{array}$$

Subtracting Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.
2. Subtract the two numerators and keep the denominators the same.
If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.
3. Subtract the whole numbers.
4. Simplify the answer.

ex: $5\frac{1}{4} - 1\frac{2}{3}$

$$\begin{array}{r} 5\frac{1}{4} = 4\frac{3}{12} = 4\frac{15}{12} \\ - 1\frac{2}{3} = 1\frac{8}{12} = 1\frac{8}{12} \\ \hline 3\frac{7}{12} \end{array}$$

Multiplying Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.
2. Cross-simplify if possible.
3. Multiply the numerators and then multiply the denominators
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\frac{1}{6} \cdot \frac{4}{7}$

$$\frac{13}{\cancel{3}^2} \cdot \frac{\cancel{4}^2}{7} = \frac{26}{21} = 1\frac{5}{21}$$

Dividing Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.
2. Keep the first fraction the same, change the division to multiplication, and flip the second fraction to its reciprocal.
3. Multiply the fractions.
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $7 \div 1\frac{3}{4}$

$$\begin{array}{r} 7 \div 1\frac{3}{4} \\ \downarrow \\ 7 \div \frac{7}{4} \\ \downarrow \\ \frac{7}{1} \cdot \frac{4}{7} = \frac{4}{1} = 4 \end{array}$$

Evaluate each expression.

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

16. $4\frac{2}{7} + 2\frac{9}{14}$

17. $8\frac{11}{12} + 9\frac{5}{18}$

18. $6 - \frac{3}{8}$

19. $8\frac{3}{5} - 2\frac{1}{3}$

20. $4\frac{1}{6} - \frac{8}{9}$

21. $\frac{4}{25} \cdot \frac{15}{16}$

22. $2\frac{3}{4} \cdot 8$

23. $6\frac{5}{8} \cdot 3\frac{1}{2}$

24. $\frac{7}{9} \div \frac{2}{3}$

25. $\frac{4}{5} \div 10$

26. $5\frac{2}{3} \div 2\frac{5}{6}$

Expressions and Equations

Evaluating Algebraic Expressions

1. Substitute the given numbers for the variables
2. Evaluate the expression using the order of operations

ex: evaluate $x + 4y$ for
 $x = 4$ & $y = 6$

$$\begin{array}{l} 4 + 4(6) \\ 4 + 24 = \boxed{28} \end{array}$$

One-Step Addition & Subtraction Equations

- Addition Equations: Subtract the number being added to the variable from both sides of the equation

ex: $4 + x = 18$

$$\begin{array}{r} 4 + x = 18 \\ -4 \quad -4 \\ \hline x = 14 \end{array}$$

- Subtraction Equations: Add the number being subtracted from the variable to both sides of the equation

ex: $20 = a - 5$

$$\begin{array}{r} 20 = a - 5 \\ +5 \quad +5 \\ \hline 25 = a \rightarrow \boxed{a = 25} \end{array}$$

One-Step Multiplication & Division Equations

- Multiplication Equations: Divide both sides of the equation by the number next to the variable

ex: $7b = 28$

$$\begin{array}{r} 7b = 28 \\ \div 7 \quad \div 7 \\ \hline b = 4 \end{array}$$

- Division Equations: Multiply both sides of the equation by the number under the variable

ex: $\frac{n}{5} = 10 \cdot 5$

$$\begin{array}{r} \frac{n}{5} = 10 \cdot 5 \\ \cdot 5 \quad \cdot 5 \\ \hline n = 50 \end{array}$$

Problem Solving

1. Read the problem. Identify the question that is being asked and the key information in the problem.
2. Plan how you are going to solve the problem and estimate the answer.
3. Solve the problem using the strategy of your choice.
4. Check your answer. Make sure your answer is reasonable and compare it to your estimate. Label your answer with appropriate units.

Evaluate each expression for $a = 5$, $b = 12$, $c = 10$, & $d = 2$.

71. $2b - a$	72. $d(ab - c)$	73. $3 + \frac{b}{d}$
74. $\frac{4a}{b + 4d}$	75. $2a^2 - c$	76. $b - c + d$

Solve each one-step equation.

77. $g + 3 = 17$	78. $r - 6 = 7$	79. $6b = 18$	80. $\frac{h}{q} = 3$
81. $5 = f - 8$	82. $48 = 12b$	83. $a + 24 = 83$	84. $17 + x = 23$
85. $10 = \frac{m}{5}$	86. $86.5 = f - 7.63$	87. $\frac{n}{6} = 11$	88. $\frac{3}{4}h = 12$