# Summer Math Packet

For students in 7th grade going into 8th grade in September

This assignment is to be handed in no later than Friday, September 5th, and late work after this date will not be accepted. Students re-registering, regardless of the date of re-registration, will be responsible for turning in summer math packets. Packets will be graded and included in the first marking period grades.
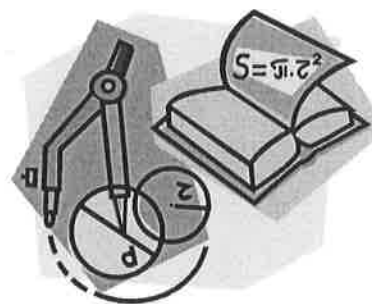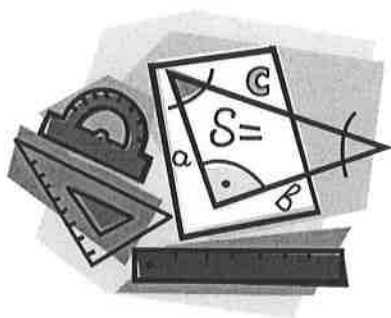
Math Objectives for Students Entering Eighth Grade

Upon entering the eighth grade, students should demonstrate proficiency with the following objectives:

- Adding, subtracting, multiplying and dividing whole numbers, decimals, integers, and fractions **quickly and accurately**
- Converting between units of standard length, capacity, and weight
- Converting between metric units of length, capacity, and weight
- Calculating volume and surface area of all regular solids
- Interpreting and creating frequency tables and box-and-whisker plots
- Finding probability of an event from a sample of outcomes
- Finding the number of combinations from a set of choices
- Finding equivalent rates and ratios
- Solving proportions
- Solving and simplify algebraic expressions, equations, and inequalities
- Graphing lines on a coordinate plane
- Finding percent of a number
- Calculating sales tax, simple interest, and percent increase/decrease

These are all skills that were taught in seventh grade. If your child is having difficulty with any of these concepts, please work on them over the summer. They will be expected to be able to solve these types of problems quickly and accurately.

Advanced Concepts

REVIEW

$$x \div 2 = 4$$
$$x \div 2 \times 2 = 4 \times 2$$
$$x \div 1 = 8$$
$$x = 8$$

Solve for the variable using reciprocals. Show your work.

1 $-\dfrac{1}{5}y = {}^-10$

2 $\dfrac{3}{2}a = \dfrac{5}{4}$

3 $\dfrac{3}{4}y = 6$

Solve for the variable. Show your work. Then check your solution.

4 $^-18 = {}^-3(z + 4)$

5 $12 - 2a = 10$

6 $5y + 35 - 6 - 2y = 23$

7 $4(a + 3) = a + 6$

8 $12y = 4y - 24$

9 $6(2z + 5) - 30 = 12z$

Complete the following statements with *is a solution* or *is not a solution*.

10 If $3b + b = 4b$, then 7 _____.

11 If $6a - a = 5a$, then 3 _____.

12 If $12y - 6(2y) = 0$, then 1 _____.

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Watch Out!

Solve.

1 345 − (⁻3) = _____

2 ⁻763 ÷ (⁻100) = _____

3 ⁻6 × 2 = _____

4 ⁻897 + (⁻31) = _____

5 5.4 ÷ (⁻2) = _____

6 ⁻1.5 × (⁻3.5) = _____

7 ⁻361.0321 × 10,000 = _____

8 20.5 ÷ 2.5 = _____

9 80.64 ÷ (⁻1.6) = _____

10 ⁻754.009 × 100 = _____

11 ⁻567.4 ÷ (⁻100) = _____

12 654.54 ÷ (⁻100) × 10 = _____

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Advanced Proportions

Cross Product Property: Given two equivalent ratios, $\dfrac{a}{b}$ and $\dfrac{c}{d}$, the cross product property states that $a \times d = b \times c$.

$$\frac{a}{2} = \frac{3}{4}$$

$$a \times 4 = 3 \times 2$$

$$a \times 4 = 6$$

$$\underset{\blacktriangle}{\underline{a \times 4 = 6}} \qquad\qquad \underset{\blacktriangle}{\underline{a \times 4 \div 4 = 6 \div 4}}$$

$$a = \frac{3}{2}$$

Use the cross product property to solve the equations.

1 $\dfrac{4}{6} = \dfrac{3}{d}$

2 $\dfrac{6}{b} = \dfrac{3}{5}$

3 $\dfrac{1}{b} = \dfrac{4}{16}$

4 $\dfrac{1}{3} = \dfrac{c}{24}$

5 $\dfrac{a}{7} = \dfrac{14}{49}$

6 $\dfrac{a}{3} = \dfrac{2}{6}$

7 $\dfrac{4}{10} = \dfrac{6}{d}$

8 $\dfrac{11}{12} = \dfrac{22}{d}$

9 $\dfrac{15}{4} = \dfrac{x}{20}$

10 $\dfrac{6}{a} = \dfrac{4}{32}$

11 $\dfrac{x}{6} = \dfrac{55}{66}$

12 $\dfrac{5}{a} = \dfrac{45}{54}$

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Rational Review 1

Solve the expressions.

1 3.789 + 123.567 = _____

2 ⁻2 − 6 = _____

3 6 × (⁻3) = _____

4 ⁻48 ÷ (⁻8) = _____

5 $\dfrac{1}{2} + \dfrac{1}{3}$ = _____

6 $\dfrac{1}{4} \div \dfrac{2}{3}$ = _____

7 $\dfrac{7}{8} \times \dfrac{3}{5}$ = _____
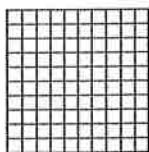
8 $-\dfrac{3}{5} \div \dfrac{1}{2}$ = _____

9 Write the fractions and decimals in order from least to greatest.

0.15, $\dfrac{1}{9}$, $\dfrac{1}{3}$, 0.2, 0.3

10 Write the fractions in order from least to greatest.

$\dfrac{1}{2}$, $\dfrac{1}{4}$, $\dfrac{1}{5}$, $\dfrac{1}{6}$, $\dfrac{1}{7}$

11 Shade the graph to represent $\dfrac{7}{10}$.

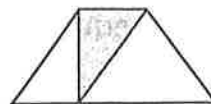**14** Write the symbol that makes the statement true:

1.52 ◯ 1.5

13 Write the symbol that makes the statement true:

$\dfrac{2}{3}$ ◯ $\dfrac{1}{2}$

16 What is the decimal equivalent of 0.7%?

18 What is the shaded portion of the figure?

17 What is the fraction equivalent of 145%?

19 Rewrite the monetary amount 55¢ using a $ sign.

20 What is the reciprocal of $\dfrac{5}{6}$?

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All Together

Solve.

1 $y \div 4 = {}^-8$

2 $x + 10 = 12$

3 $a - 9 = 16$

4 $2y = {}^-10$

5 $y \div 7 = {}^-56$

6 $3y = {}^-12$

7 $b - 4 = {}^-7$

8 $y \div {}^-6 = 24$

9 $z + {}^-5 = {}^-7$

10 $2a \div 4 = 3$

11 $5y \times 5 = 30$

12 $3x + 5x = 2x + 2$

13 $4x + 3 = 23$

14 $7x + 8 = 57$

15 $\dfrac{3x}{4} + 11 = 22 - 5$

16 $\dfrac{36}{x} = 18$

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Number Lines

≥ 2

```
←——+——+——+——+——+——+——●——+——+——→
   -4  -3  -2  -1   0   1   2   3   4
```

< 2

```
←——+——+——+——+——+——+——○——+——+——→
   -4  -3  -2  -1   0   1   2   3   4
```
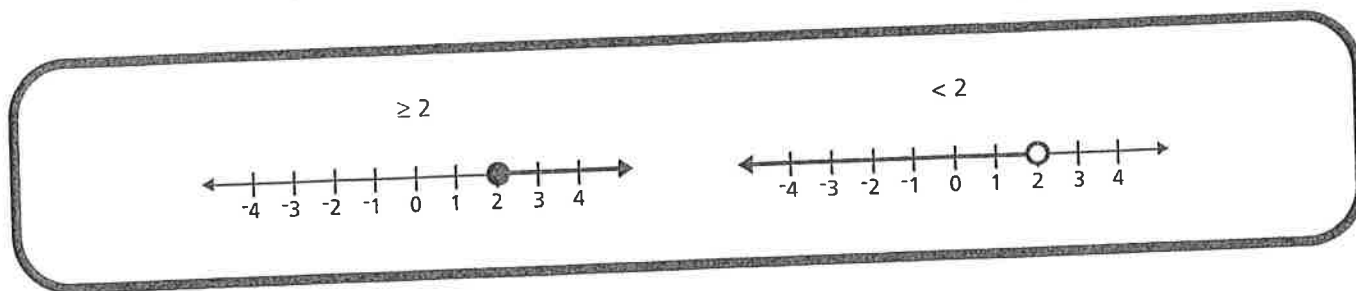
Represent the following values.

1 ≥ 4

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
```

2 < 5

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
```

3 ≥ ⁻3

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
```

4 ≤ 0

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
```

5 > 2.5

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
```

6 ≤ $3\frac{3}{4}$

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
```

7 ≤ 5 and > 2

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
```

8 < 2 and ≥ 5

```
←——+——+——+——+——+——+——+——+——+——+——+——+——→
  -6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6
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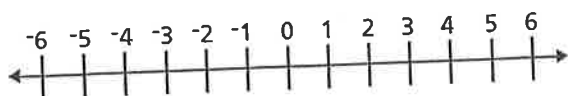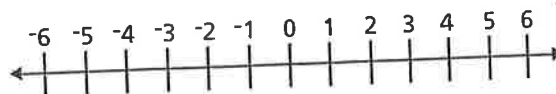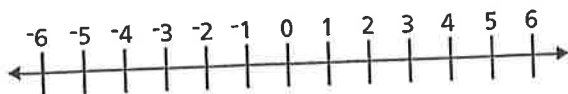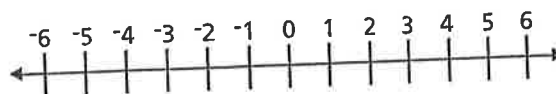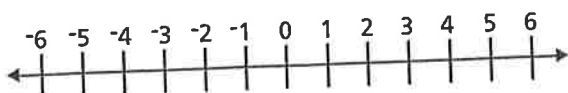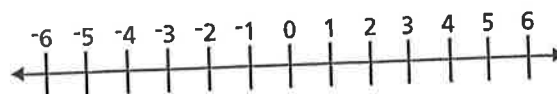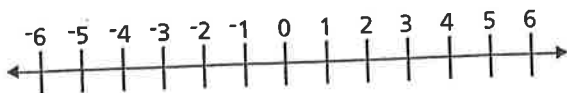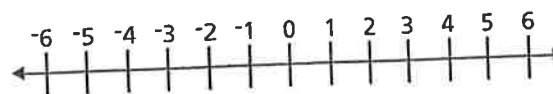
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Discounts

A $35 sweater is on sale for 30% off.
How much is the discount?   30% = 0.30 $35 × 0.30 = $10.50 discount
How much is the new price?   100% − 30% = 70% $35 × 0.70 = $24.50 sale price

Solve.

1 A store offers 40% off its merchandise. What is the discount on a $68 outfit?

2 A store offers 25% off its merchandise. What is the sale price of a $75 outfit?

3 A store offers 15% off its merchandise. What is the discount on a $36 pair of jeans?

4 A store offers 10% off its merchandise. What is the sale price of a $28 shirt?

5 A store offers 30% off its merchandise. What is the discount on a $20 game?

6 A store offers 25% off its merchandise. What is the sale price of a $50 pair of shoes?

7 A store offers 5% off its merchandise. What is the discount on a $40 watch?

8 A store offers 20% off its merchandise. What is the sale price of a $35 shirt?

9 A store offers 15% off its merchandise. What is the discount on a $1,049 pair of earrings?

10 A store offers 25% off merchandise that is already discounted by 30%. Is this **the same as** a 55% discount off the original price? Write an example to illustrate your reasoning.

Percent Word Problems

Solve the word problems.

1. Saul had 445 points out of 500 during his first semester of science. What was his grade when expressed as a percent?

2. Joyce saw a sweater that was originally $60 but was on sale for 20% off. What was the new price of the sweater?

3. If cassette tapes are currently $12 each and are expected to increase in price by 25%, what will the new price be?

4. Suki saved $252. This is 63% of what she needs for a new stereo. How much is the new stereo?

5. A solar calculator that was $60 last year is now $63. What percent increase is this?

6. Paco's doctor told him to reduce his calorie intake by 15%. He has been consuming 2000 calories. How many may he now have?

7. A coat on sale for $84 is selling for 70% of the original price. What was the original price?

8. There are currently 650 students enrolled in the local high school. However, next fall the population is expected to increase by 6%. How many additional students will there be?

9. The concert hall holds 2500 people and always reserves 25% of the seats for students. How many seats are available for students?

10. The junior high school had a total of 840 students. They were given a survey asking them to indicate their favorite subject. 336 students replied that mathematics was their favorite subject. What percentage of the student population liked math the most?