

*Important Concepts . . .*

# Preview Review



**Mathematics    Grade 8**

**W1 - Review:**

## Important Concepts of Grade 8 Mathematics

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W1 - Lesson 2 .....	Working with Ratios and Rates
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## Materials Required

Protractor  
Ruler  
Calculator

**No Textbook  
Required**

**This is a stand-  
alone course.**

## Mathematics Grade 8

Version 6

Preview/Review W1 - Review

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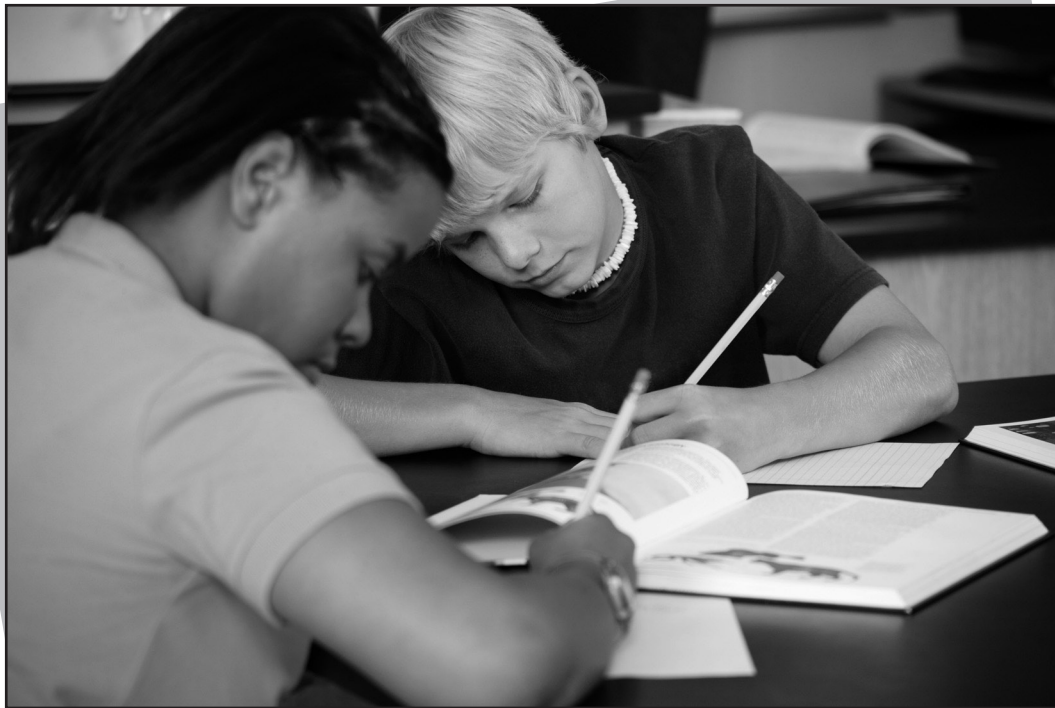
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# Preview/Review Concepts for Grade Eight Mathematics



***W1 – Review***



## W1 – Review:

### Materials required:

- Paper, Pencil, Calculator, and Grid Paper

## Part 1: Perfect Squares and Square Roots

**Perfect square:** a number that has a whole number as its square root. They are called perfect squares because they form a square when they are laid out using algebra tiles.

**Square root:** a number that when multiplied by itself results in a specific number. When asked to find the square root of a given number, ask yourself “What number do I multiply by itself to result in a product of the given number?”

Or press the  $\sqrt{\quad}$  on your calculator and then type in the number

## Practice Questions

1. Calculate the square of the following numbers.

a. 10

b. 13

c. 15

2. Calculate the square root of the following numbers.

a.  $\sqrt{81}$

b.  $\sqrt{161}$

c.  $\sqrt{200}$

## Part 2: Ratios and Rates

**Ratio:** a comparison of two or more values using the same units.

**Part-to-part ratio:** a ratio that compares one part of a collection to another part of a collection.

**Part-to-whole ratio:** a ratio that compares a part of a collection to the entire collection.

**Rate:** a comparison of amounts or measurements using different units.

**Unit Rate:** a rate with the second term being 1.

### Practice Questions

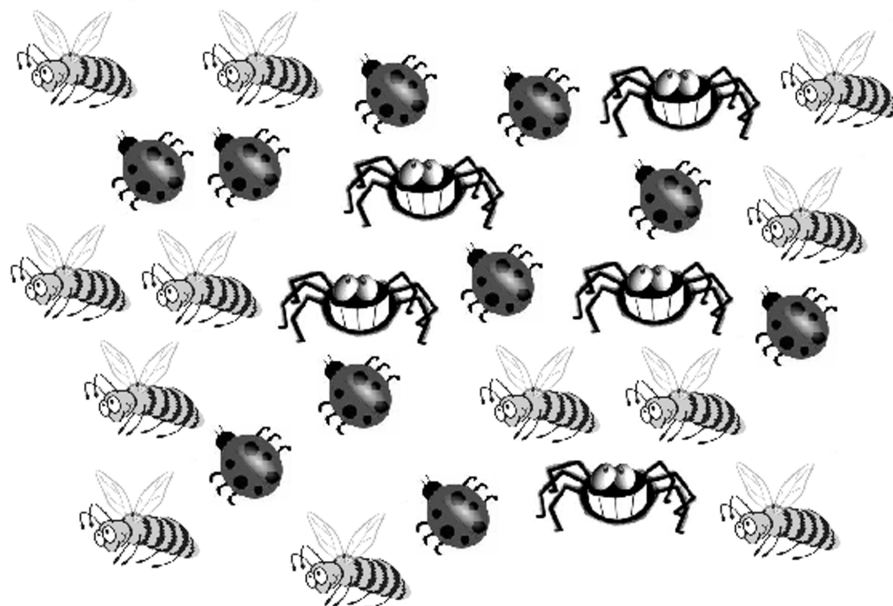
1. Simplify the following ratios.

a.  $6 : 18$

b. 9 to 24

c.  $63 : 42 : 7$

2. Determine the following ratios using the given diagram.



- a. Ladybugs to spiders
- b. Spiders to all the other bugs
- c. Bees to total number of bugs



3. Calculate the following unit rates.

a. Typing 175 words in 5 minutes

b. Running 110 metres in 10 seconds

c. Paying \$13.20 for 600 grams of gourmet jelly beans (Hint: Express the unit rate per 100 grams)

## Part 3: Multiplying and Dividing Fractions

### Multiplying Fractions

When multiplying fractions, remember these steps:

**Step 1:** Convert any mixed numbers into improper fractions.

**Step 2:** Simplify the numerators and denominators. To do this, divide the numerators and denominators by a common factor.

**Step 3:** Multiply the numerators.

**Step 4:** Multiply the denominators.

**Step 5:** If an improper fraction results, change it into a mixed number.

### Dividing Fractions

When dividing fractions, remember these steps:

**Step 1:** Convert any mixed numbers into improper fractions.

**Step 2:** Multiply the first term by the reciprocal of the second term. The reciprocal is the “flip” of the fraction or number.

**Step 3:** Multiply the numerators.

**Step 4:** Multiply the denominators.

**Step 5:** If an improper fraction results, change it into a mixed number.

### Practice Questions

1.  $\frac{4}{5} \times \frac{5}{8} =$

2.  $\frac{9}{10} \div \frac{1}{2} =$

3.  $3\frac{2}{5} \div \frac{3}{5} =$

4.  $\frac{4}{9} \times 2\frac{1}{13} =$

5.  $5\frac{1}{2} \div 3 =$

6.  $4 \div \frac{1}{8} =$

7.  $\left(\frac{4}{9} + 2\frac{1}{6}\right) - \frac{7}{12} \times \frac{16}{21} =$

## Part 4: Multiplying and Dividing Integers

### Multiplying integers

Multiplying integers involves a similar process as multiplying whole numbers. Apply the following sign rules when multiplying integers:

- If there is an **even** number of negative signs, then the answer will be **positive**
- If there is an **odd** number of negative signs, then the answer will be **negative**

### Dividing integers

Dividing integers involves a similar process as dividing whole numbers. Apply the following sign rules when dividing integers:

- If there is an **even** number of negative signs, then the answer will be **positive**
- If there is an **odd** number of negative signs, then the answer will be **negative**

### Practice Questions

1.  $(-7) \times (-10) =$

2.  $(+36) \div (-12) =$

3.  $(-15) \times (+4) =$

4.  $(-6) \times (+7) =$

5.  $(-75) \div (+5) =$

6.  $(-64) \div (-4) =$

7.  $((-6) + 6 \times (-5)) \div 3^2 =$

## Part 5: Working with Percents

A percent can also be expressed as a decimal number and in fraction form.

- To express a percent as a decimal, remove the percent symbol, and move the decimal point in the percentage two places to the left.
- To express a percent as a fraction, place the percent over 100 and drop the percent symbol. Then simplify the resulting fraction.

A decimal can also be expressed as a percent and in fraction form.

- To express a decimal as a percent, move the decimal point two places to the right and add a percent symbol at the end of the number.
- To express a decimal as a fraction, place the decimal number over a denominator that is equal to the last place value in the decimal number and remove the decimal point. Then simplify the resulting fraction.

A fraction can also be expressed as a percent and as a decimal number.

- To express a fraction as a decimal, divide the numerator by the denominator. Mixed numbers can also be expressed as decimals by applying the same rules.
- To express a fraction as a percent, divide the numerator by the denominator, and move the decimal point two places to the right. Then add a percent symbol behind the resulting number. Mixed numbers can also be expressed as percentages by applying the same rules.

### Practice Questions

1. Complete the following table. Express the following percents as a decimal number and in fraction form.

Percentage	Decimal Number	Fraction Form
63%		
	0.024	
		$\frac{3}{20}$

