

Grade 8 Math Year End Review 2015

Unit 1: Square Root and Pythagorean Theorem

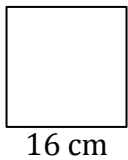
1. What is a **perfect square**? List the first 15 Perfect Squares.

2. Do you know the difference in **squaring** a number vs **Square rooting** a number? X^2 vs \sqrt{x}
Solve the following: 36^2 and $\sqrt{36}$

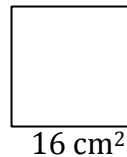
What does it mean to **square** a number?

What does it mean to **square root** a number?

3. Does the **side length** of a square get squared or square rooted to find the area?
Does the **area** of the square get squared or square rooted to find the side length?
Find the unknown side length or the area of each square. Hint: use your units to help you determine what information is given to you.

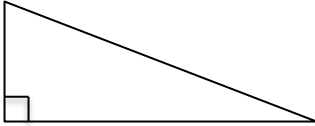


VS



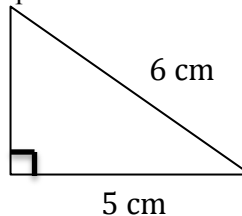
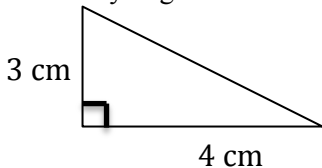
4. How do you estimate a square root number? What is a good estimate for the square root of 37?

5. What is the **hypotenuse** and **legs** of a triangle? How do you know which is which? Label the triangle.



6. What is the **Pythagorean Theorem**? What important detail do you have to look for when using the Pythagorean Theorem?

7. Use Pythagorean Theorem to solve the following examples:



8. What is a **Pythagorean Triple**? Prove if 8cm, 9cm, 12 cm is a Pythagorean Triple.

Unit 2: Integers

1. Can you **add** integers?

$$(+12) + (+23) =$$

$$(+12) + (-23) =$$

$$(-12) + (+23) =$$

$$(-12) + (-23) =$$

2. Can you **subtract** integers? Tip: add the opposite

$$(+12) - (+23) =$$

$$(+12) - (-23) =$$

$$(-12) - (+23) =$$

$$(-12) - (-23) =$$

3. Can you **multiply** integers?

$$(+8) \times (+6) =$$

$$(+8) \times (-6) =$$

$$(-8) \times (+6) =$$

$$(-8) \times (-6) =$$

4. Can you **divide** integers?

$$(+24) \div (+4) =$$

$$(+24) \div (-4) =$$

$$(-24) \div (+4) =$$

$$(-24) \div (-4) =$$

5. a) In a basic equation, when do you get a **positive integer** as an answer?

b) In a basic equation, when do you get a **negative integer** as an answer?

6. Define **sum**, **difference**, **product** and **quotient**.

7. A golf tournament is nine rounds. Katie shot -1 in two rounds, -2 on one round, and +3 on another two rounds, +1 on three rounds and a +5 on one round. What was Katie's final score?

8. What is **Order of Operations** and when do you use it?

9. Solve the following:

a) $(-5) + (-12) \div (-3) =$

b) $(-3) \times (+7) \div (-2) + 5 =$

c) $[7 - (-2)] \times 2 + (-12) \div (-4)$

d) $[(-9) - (-2)] \times 8^2 + (-15) \div (-5) - [(-3) + (-2)]$

Unit 3: Operations with Fractions

1. Can you **add** fractions? --Hint: Common denominator--

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

$$\frac{3}{5} + \frac{1}{4} =$$

2. Can you **subtract** fractions?

$$\frac{6}{7} - \frac{2}{7} =$$

$$\frac{7}{8} - \frac{3}{7} =$$

3. Can you **convert mixed fraction and improper fractions?**

$$\frac{15}{4}$$

$$\frac{19}{8}$$

$$\frac{18}{6}$$

$$2\frac{1}{3}$$

$$4\frac{3}{8}$$

$$5\frac{6}{7}$$

4. Can you **multiply** fractions?

$$\frac{3}{5} \times \frac{2}{5} =$$

$$\frac{4}{6} \times \frac{9}{8} =$$

$$2\frac{7}{9} \times 3\frac{1}{4} =$$

$$4 \times \frac{6}{7} =$$

5. Can you **divide** fractions? Multiply the **reciprocal**

$$\frac{7}{12} \div \frac{2}{5} =$$

$$\frac{5}{3} \div \frac{4}{5} =$$

$$1\frac{7}{8} \div 1\frac{1}{4} =$$

$$7 \div \frac{2}{3} =$$

6. Can you simplify before solving? What operations can you apply this skill to?

$$\frac{32}{45} \times \frac{42}{56} =$$

$$\frac{72}{64} \div \frac{36}{76} =$$

7. Can you use diagrams to represent multiplication of fractions?

Shaded Rectangle

* for **proper fractions**

$$\frac{4}{7} \times \frac{2}{5} =$$



Rectangle Model/Partial Product

* for **mixed fractions** or double digit plus numbers

$$2\frac{1}{3} \times 5\frac{4}{7} =$$



8. Can you solve fraction word problems:

a) Ms. Lecky ordered pizza for a party. $1\frac{5}{8}$ of the vegetarian pizza and $\frac{2}{3}$ of the ham and pineapple pizza were not eaten.

How much pizza was left?

b) A dressmaker needs $3\frac{3}{8}$ m of fabric to sew one dress. How many dresses can be made with 28 m of fabric?

9. Solve:

a) $\frac{7}{9} - (\frac{1}{3} + \frac{5}{6}) \div 3$

b) $4 \div \frac{2}{3} - 3\frac{1}{4} + \frac{7}{12}$

c) $\frac{5}{6} - \frac{2}{5} \times (\frac{1}{2} + \frac{1}{6})$

d) $\frac{5}{6} - \frac{2}{5} \times \frac{1}{2} + \frac{1}{6}$

e) $(\frac{5}{6} - \frac{2}{5}) \times (\frac{1}{2} + \frac{1}{6})$

Unit 4: Measuring Prisms and Cylinders

1. What is the difference between a **prism** and a **pyramid**?

2. Draw the **nets** for:

a) a pentagonal prism and

b) a triangular prism and

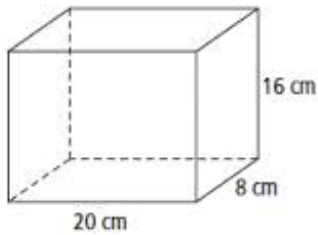
a pentagonal pyramid

a triangular pyramid

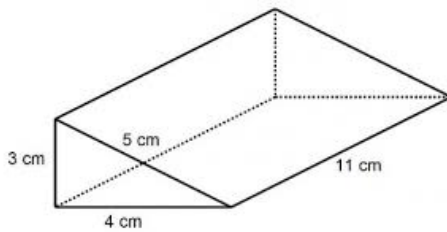
3. a) What's the difference between **surface area** and **volume**?

b) What are the **units** for surface area and volume?

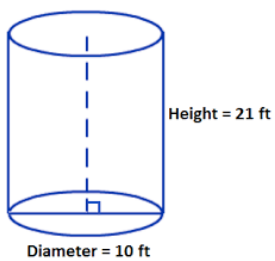
4. Calculate the **surface area** and **volume** of this **rectangular prism**.



5. Calculate the **surface area** and **volume** of this **triangular prism**.



6. Calculate the **surface area** and **volume** of this **cylinder**.



Unit 5: Percent, Ratio and Rates

1. Write each **percent as a fraction and a decimal**.

a) 0.04%

b) 4.25%

c) $4\frac{2}{5}\%$

2. Write each **fraction as a decimal and a percent**.

a) $\frac{3}{8}$

b) $\frac{2}{3}$

c) $\frac{1}{1000}$

3. Write each **decimal as a percent and fraction**.

a) 0.682

b) 0.0045

c) 1.7

4. Calculate the **percent of an unknown number or a number from a percent of a number**.

a) Find the number in each case.

i) 30% of a number is 12.

ii) 2% of a number is 9.

iii) 150% of a number is 60.

b) Find the whole amount in each case.

i) 8% is 72 cm

ii) 0.6% is 18 g.

iii) 120% is 24 m.

c) One hundred sixty students attended Music Night on Thursday night.

The attendance on Friday night was 120% of the attendance on Thursday night.

The attendance on Saturday night was 75% of the attendance on Friday night.

i) How many people attended Music Night on Friday night?

ii) How many people attended on Saturday night?

iii) What was the total attendance for the 3 nights?

d) A house was purchased for \$450 000. Three years later, the house was sold for 124% of its purchase price. What was the selling price of the house?

5. Can you calculate a percent increase and decrease?

a) Write each increase as a percent.

i) The price of gasoline increased from 93.9¢ to 99.9¢.

ii) The price of a car increased from \$32 000 to \$36 000.

b) Write each decrease as a percent.

i) The number of employees decreased from 6800 to 5200.

ii) The area of a park decreased from 840 ha to 672 ha.

c) A printing machine produces labels. Four percent of the labels produced are defective. Suppose 372 labels were defective. How many labels are not defective?

d) A field goal kicker was successful 75% of the time. He made 51 field goals. How many kicks did he make in total?

e) Lesley and Enid left their waitress a 15% tip. The tip was \$10.25. What was their total bill, not including the tip?

6. Can you solve percent problems

a) If you purchase a Notebook computer: Regular price \$1598, now 20% off

- i) Calculate the discount.
- ii) Calculate the sale price, before taxes.
- iii) Calculate the sale price, including taxes of 5%.

b) If you purchase an electronic game marked down from \$56.84 to \$49.99

- i) the percent decrease in price
- ii) the sale price, including taxes

c) A camera shop reduced the price of a digital camera by 10% at the end of the first week, by 20% at the end of the second week, and by a further 20% at the end of the third week. The original price of the camera was \$625.

- i) Calculate the sale price after 3 weeks.
- ii) Calculate the sale price after 3 weeks, including the sales taxes of 5%.

7. Write part to part ratios and part to whole ratios

a) A baseball team has 3 outfielders, 4 infielders, and a battery (the pitcher and the catcher). Write each ratio.

- i) outfielders to infielders
- ii) infielders to the battery
- iii) the battery to the entire team

b) Write each **ratio in simplest form** (and i and ii as a percent).

- i) 6:18
- ii) 10:25
- iii) 16:12:20
- iv) 15:60:45

c) Find pairs of **equivalent ratios**.

- | | |
|----------|----------|
| 3:15:21 | 3:6 |
| 2:7 | 9:18 |
| 2:5 | 12:15:21 |
| 20:50 | 8:28 |
| 10:18 | 2:10:14 |
| 24:30:42 | 5:9 |

d) An advertisement claims that 7 out of 8 people prefer Brand X. Suppose 216 people were interviewed. Find the number of people who prefer Brand X.

8. Can you find rates and compare rates?

a) Express as a unit rate.

- i) The bus travelled 80 km in 2 h.
- ii) Wally washed 20 plates in 4 min.

b) Sal earns \$24 in 3 h. Josh earns \$13 in 2 h. Komal earns \$44 in 4 h.

- i) Who makes the most money per hour?
- ii) How much will the person who earns the most money per hour earn in 8 h?

c) Which is the better buy?

- i) 5 oranges for \$1.65 or 8 oranges for \$2.77
- ii) 2 L of lemonade for \$2.56 or 1 L for \$1.32
- iii) 3 kg of apples for \$5.70 or 2 kg for \$3.90

d) A 2.5-kg bag of flour contains enough flour to make 4 cakes. How much flour is needed to make 50 cakes?

Unit 6: Linear Equations and Graphing

1. Solve for an unknown using **balance scales** and **verify**

a) $5x + 4 = 44$

b) $7 + 2x = 1$

2. Solve for an unknown using **algebra tiles** and **verify**

a) $13 = 3x - 2$

b) $-2x + 8 = 0$

3. Solve **algebraically** and **verify**

a) $12b + 21 = 93$

b) $-8a + 11 = 27$

c) $-42 = 5c - 27$

d) $\frac{n}{3} - 2 = 10$

e) $\frac{t}{-9} + 8 = -5$

f) $-17 + \frac{n}{-3} = 9$

3. **Expand.**

a) $5(x + 6)$

b) $7(5 - e)$

c) $3(-x + 8)$

d) $-4(6 - e)$

e) $8(-2n + 4)$

f) $-4(-11y + 3)$

4. Solve each equation using **distributive property**. Verify the solution.

a) $4(p - 6) = -4$

b) $10(y + 3) = 10$

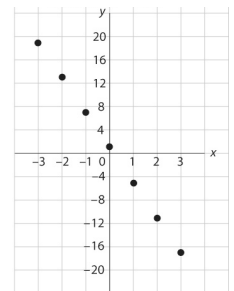
c) $-7(b + 6) = -84$

d) $-5(q - 11) = 70$

5. Create a **table of values** from -3 to 3 for $y = 2x - 5$

6. Identify the **linear rule** that matches a graph

Does this graph represent
 $y = 5x - 1$ OR $y = -6x + 1$



7. The equation of a linear relation is: $y = -3x + 8$. Some **ordered pairs** in the relation are:

$(-1, 11)$, $(0, 8)$, $(1, \quad)$, $(2, 2)$, $(\quad, -1)$, $(4, \quad)$ Find the missing numbers in the ordered pairs.

8. Can you solve **linear word problems**?

The cost of admission to a fair is \$10, plus \$3 per ride. An equation for this relation is

$C = 10 + 3r$, where r represents the number of rides a person goes on, and C represents the total cost of admission and rides.

a) Harvey went on 13 rides. How much did Harvey spend on admission and rides?

b) Stephanie spent \$31 on admission and rides. How many rides did Stephanie go on?

Unit 7: Data Analysis and Probability

1. Explain the difference between **discrete** vs **continuous data**
2. Can you **critique graphs**. Explain why a type of graph would be better than the others
Bar Graph:

Line Graph:

Circle Graph:
3. How can data be misrepresented and why do some people intentionally misrepresent data in a graph?
4. Can you find the **experimental and theoretical probability** of an event?
Ten cards are chosen at random from a deck of cards. 5 clubs, 2 hearts, 0 spades and 3 diamonds were picked.
 - a) What is the experimental probability of choosing a heart?
 - b) What was the theoretical probability of choosing a heart?
5. Can you find the probability of **independent events**?
A regular 6-sided die is rolled three times. Find the probability of each event:
 - a) Three 6s in a row
 - b) 5, 1, even
 - c) Odd, greater than 2, 5

Unit 8: Geometry

1. What's the difference between a **horizontal and vertical axis**?
2. What's the difference between a **horizontal rotation** and a **rotation about the horizontal axis**?
3. When drawing views of objects, we should only include lines to separate boxes when....
4. What are the 3 different **transformations**?