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7th Grade Semester 1 You Should Know…. KEY

Use this guide and your SBAC Interim Review to study for your final exam. Attach graph paper.

1. **Absolute Value.**
   a. Define: Absolute value is a number's **distance from zero on a number line.**
   b. $|-4-3)| + |-2|$ **= 9**
   c. $|10-23| + |-7|$ = 20

2. **Additive Inverse.**
   a. Define: **A number plus its opposite equals zero.**
   b. Give two examples of Additive Inverse.
      i. **6+(-6) = 0** ii. **-7+7=0**

3. **Add & Subtract Integers.** Use **T-charts** to solve.
   a. Same signs **add and keep**
   b. Different signs **subtract and keep the sign of the bigger number**
   c. If subtracting, use **K.C.C. (Keep Change Change) change the sign and add a line**
4. Draw a number line and practice adding and subtracting integers using T-charts and number lines.
   a. $-3+7$ **= 4**
   b. $-8-10$ **= -18**
   c. $4+(-10)$ **= -6**
   d. $2-14$ **= -12**
   e. $-9-(-12)$ **= 3**

5. **Multiply & Divide Integers.** Use **Triangles** to solve.
   a. Same signs **answers are positive**
   b. Different signs **answers are negative**
   c. If you have more than two numbers, **count the number of negatives, odd number is negative and even number is positive**
6. **Practice Multiplying integers.**
   a. $-5(-2)$ **= 10**
   b. $-2\,(-4)(3)$ **= 24**
   c. $-36 \div 6$ **= -6**
   d. $12 \div (-2)(-5)$ **= 30**
   e. $-90 \div 10 \div (-3)$ **= 3**

7. **Dividing with zero.**
   a. When zero is in the numerator, the answer is **zero** Ex. $\frac{0}{7} = 0$

   b. When zero is in the denominator, the answer is **undefined**. Ex. $\frac{8}{0} = undefined$

8. **Unit Rate.** Circle and set up the **units** you want into a **fraction.**
   Fill in numbers given and **divide** to get a denominator of **1**.

   Then use your unit rate to solve problems asking for a different quantity by **multiplying**.

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a. A car drove 450 miles in 5 hours. How many miles per hour is the car driving (unit rate)? **90 miles/hour**
b. At this rate, how many miles would the car drive in 2 hours? 180 miles
c. 3 hours? **270 miles**
d. 10 hours? **900 miles**
e. On graph paper, draw and label a graph to support your data.

9. **Unit Price.** The price in **money** for **1** of each quantity.

To find a unit price, divide **money** by **quantity.**

a. Jasmine bought 12 cupcakes for $30. What is the unit price for one cupcake? **$2.50/cupcake**
b. At this price, how much would it cost to buy 18 cupcakes? $45
c. 20 cupcakes? **$50**
d. 6 cupcakes? **$15**

10. **Complex Fractions.** Keep the **numerator** and **multiply** by the **reciprocal (flipped fraction)** of the **denominator**. Simplify.

a. $\frac{\frac{2}{5}}{10} = \frac{1}{25}$

b. $\frac{\frac{1}{3}}{\frac{5}{6}} = \frac{2}{5}$

c. $\frac{20}{\frac{2}{9}} = 90$

11. **Proportional Tables.** Set up fractions as $\frac{y}{x}$ and reduce. To be proportional, all ratios must be **equivalent**.

Determine which of these tables are proportional.

a.

Hours	Dollars
2	20
3	25
4	30
5	35

Not proportional

b.

Hours	2	4	6	8
Dollars	12	24	36	48

Proportional

c. What is the constant of proportionality of the graph that is proportional? **6**
d. What is the equation of the proportional graph? **y=6x**

12. **Proportional Graphs.**

a. For a graph to be proportional, it must be a **straight line** and cross the **origin (0,0).**
b. On a proportional graph, the unit rate is where **x=1**
c. The equation for a proportional graph takes the form **y=kx**.
d. Lilly cooks 2 cakes per hour. How can this proportional relationship be written as an equation? **y=2x**
e. Graph the above relationship and put a colored dot on the unit rate of the graph.
f. Interpret what the point (4, 8) represents on the graph. **After 4 hours, Lilly has baked 8 cakes.**

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g. Proportional graphs have a relationship that is called **Direct Variation**

13. **Solving Proportions.** Make sure you set up your **units** correctly.

Use **cross products** to solve proportions.

Set up and solve the following proportions.

a. If there were 45 dogs in a shelter and 60% were adopted in January, how many dogs were adopted in January?

Option 1 $\frac{d}{45} = \frac{60}{100}$ $(\frac{part}{whole} = \frac{percent}{100})$ **27 dogs**

Option 2 $\frac{45}{d} = \frac{100}{60}$ $(\frac{whole}{part} = \frac{100}{percent})$ **27 dogs**

Either way, make sure the whole and 100 line up, and the part and the percent line up

b. 20 percent of the class got As on the final exam. If there are 30 students in the class, how many got As on the final exam?

Option 1: $\frac{d}{30} = \frac{20}{100}$ $(\frac{part}{whole} = \frac{percent}{100})$ **6 students**

Option 2: $\frac{30}{d} = \frac{100}{20}$ $(\frac{whole}{part} = \frac{100}{percent})$ **6 students**

c. There are 3 red roses for every 2 pink roses. If there are 40 roses in the flowerbed, how many are there of each color rose?

Option 1: $\frac{3}{5} = \frac{r}{40}$ $(\frac{red}{total\ roses} = \frac{red}{total\ roses})$ **24 red roses & 16 pink roses**

Option 2: $\frac{2}{5} = \frac{p}{40}$ $\frac{pink}{total\ roses} = \frac{pink}{total\ roses}$ **24 red roses & 16 pink roses**

14. **Rate of Change.** A **constant** rate that an amount is changing. A relationship does not need to be proportional to have a constant rate of change. Find the rate of change by finding the **difference of the y values** and dividing by the **difference of the x values**.

Find the rate of change for the following relationships.

a.

Hours	Gallons
3	15
6	30
9	45

Change in y = 15

Change in x = 3

Rate of change = 5

b.

Hours	5	6	7
Gallons	150	200	250

Change in y = 50

Change in x = 1

Rate of change = 50

15. **Slope.** The slope of a line can be found by using the formula: $slope = \boldsymbol{m} = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1}$

You can also find it on a graph by calculating the $\frac{rise}{run}$

a. Use the slope formula to find the slopes from the tables in 14.a and 14.b above.

14.a) Slope= 5 14.b) Slope=50

b. On graph paper, graph the lines formed by the given tables. Label the rise green and the run blue.

c. What do you notice about slope and rate of change? **They are equal**

d. Bonus, what is the equation for the graph you made? (Hint, use y=mx+b format, where m is the slope and b is the y-intercept)

14.a) $y = 5x$ **14.b)** $y = 50x - 100$