Name: Key E#_____

Review:

Ratios and Proportions

Fraction/Decimal/Percent Conversions

Ratios

Rates/ Unit Rates

Proportions

Percent Application

Measurement Conversions

Conversions

Changing fractions to decimals: divide the bottom number into the top number

$\frac{1}{2} = 2\overline{)1.5} = .5$ $\quad 8\frac{1}{5} \Rightarrow 5\overline{)1.2} = 8.2$

Changing decimals to fractions: place a one under the point and a zero under the digits

$.7 = \frac{.7}{10} = \frac{7}{10}$ $\quad 3.73 = 3\frac{.73}{100} = 3\frac{73}{100}$ $\quad 2.6 = 2\frac{.6}{10} = 2\frac{6}{10} = 2\frac{3}{5}$

Changing Decimals to Percents: move decimal point two places to right (add zeros)

.27 = 27.% $\quad$ 1.4 = 140.% $\quad$ 7 = 700.% $\quad$ .005 = .5%

Changing Percents to Decimals: move the decimal point two places to the left (add zeros)

30% = .30 $\quad$ .57% = .0057 $\quad 8\frac{1}{5}\% \Rightarrow 5\overline{)1.2} = 8.2\% = .082$

Note: place a decimal point even if you don't see one

Fill in the missing pieces in charts below.

Fraction	Decimal	Percent
$\frac{1}{5}$	.20	20%
$1\frac{29}{50}$	1.58	158%
$\frac{5}{8}$	0.625	62.5%
$\frac{63}{100}$	.63	63%
$\frac{1}{5}$	.20	20%

Fraction	Decimal	Percent
$\frac{2}{9}$	$0.\overline{2}$	22.2%
$\frac{87}{100}$	.87	87%
$1\frac{1}{5}$	1.2	120%
$1\frac{49}{50}$	1.98	198%
$\frac{1}{5000}$	0.0002	.02%

Compare/Order Fractions, Decimals & Percents

****A number line increases in value from left to right****

- If comparing numbers in a mixed set, convert all to same form and then compare & order

Compare the following using <, > or =

1.) 3/4 (.75) > .5

2.) 75% < .82

3.) 1/8 < .2

4.) .85 > 5/6 (.83)

5.) .3 > 1/4

6.) 1/10 (0.1) > .09

7.) .009 < 3/100 (.03)

8.) 2 4/5 < 3.01

9.) 14% < .2

Put the following numbers in *descending* order (greatest to least).

1.) -3, -7, -9, 3, -53

3 , -3 , -7 , -9 , -53

2.) $-25, \frac{7}{16}, 0.44, -3, 3$ (7/16 = 0.4375)

3 , 0.44 , 7/16 , -3 , -25

3.) $\frac{2}{9}, 22.2\%, .223, \frac{1}{3}, \frac{1}{4}$ ($\frac{2}{9} = 0.\overline{2}$, $\frac{1}{3} = 0.\overline{3}$, $\frac{1}{4} = 0.25$)

1/3 , 1/4 , .223 , 2/9 , 22.2%

4.) 45%, $\frac{3}{8}$, -4, .452, -5 (45% = 0.45, $\frac{3}{8} = 0.375$)

.452 , 45% , 3/8 , -4 , -5

Put the following numbers in *ascending* order (least to greatest).

5.) -289, -290, -291, -280, -286

-291 , -290 , -289 , -286 , -280

6.) -50, 3.89, 388%, 388.8%, 388 (3.89 < 3.888 < 388% < 388)

-50 , 388% , 388.8% , 3.89 , 388

7.) .45%, .46, $\frac{9}{20}$, -8, 0 ($\frac{9}{20} = 0.45$)

-8 , 0 , .45% , 9/20 , .46

8.) -6, -7, $\frac{5}{6}$, 83.3%, $\frac{7}{8}$ ($\frac{5}{6} = 0.8\overline{3}$, $\frac{7}{8} = 0.875$)

-7 , -6 , 83.3% , 5/6 , 7/8

Percents

Remember: OF means multiply

Percent = Per 100..... out of 100

A percent is a ratio that compares a number to 100.

Ex. 8% means: or "8 per hundred"

ALSO_, "8 out of 100".....OR.....8 hundredths.....OR_____8 ÷ 100

Finding Percent of a number: $\frac{\%}{100} = \frac{\text{is \#}}{\text{of \#}}$ OR $\frac{\%}{100} = \frac{\text{Part}}{\text{Whole}}$

EX) What is 35% of 400?

a) Fill in what you know into the proportion: $\frac{35}{100} = \frac{x}{400}$

b) Cross multiply and divide: $\frac{14000}{100} = \frac{100x}{100}$

c) Solve for x: x=140

Practice #1 :
20% of 150 $\frac{20}{100} = \frac{x}{150}$ 30

Practice #2 :
25% of 640 $\frac{25}{100} = \frac{x}{640}$ 160

The six grade students at SMS were going on a field trip. 85% of the 280 students have turned in their permission slips. How many students have turned in their permission slips?
$\frac{85}{100} = \frac{x}{280}$ 238 students

The frozen yogurt stand in the mall sells 420 yogurt cups per day. Forty-five percent of the cups are sold to middle school students. How many yogurt cups are sold to middle school students each day?
$\frac{45}{100} = \frac{x}{420}$ 189 cups

Try some more:

1.) Find 20% of 400. $\frac{20}{100} = \frac{x}{400}$ 80

2.) 108 is what percent of 144? $\frac{x}{100} = \frac{108}{144}$ 75%

3.) 200% of what number is 90? $\frac{200}{100} = \frac{90}{x}$ 45

4.) What number is 12% of 240? $\frac{12}{100} = \frac{x}{240}$ 28.8

5.) 25% of what number is 120? $\frac{25}{100} = \frac{120}{x}$ 480

6.) What percent of 40 is 200? $\frac{x}{100} = \frac{200}{40}$ 500%

7.) Kodak Camera had a tripod sale. If 80% of the 60 tripods sold, how many did not sell?
$\frac{20}{100} = \frac{x}{60}$ 12 did not sell

Percent Application

Finding the Percent of Change: $\frac{\%}{100} = \frac{Part}{Whole}$ OR $\frac{\%}{100} = \frac{change}{original}$

Discount, tax, and tip is the "Part"

EX): In a video store, a DVD that sells for $20 is marked "15% off."
What is the discount? What is the sale price of the DVD?

$\frac{15}{100} = \frac{d}{20}$ 100d=300 d=3

The discount is $3 and the sale price is $17.

Tax- Add Tip- Add Discount- Subtract

1.) A motorized scooter costs $220. What is the sale price if it is on sale for 20% off?
$\frac{20}{100} = \frac{x}{220}$ $44 OFF $176

2.) A lunch bill for two comes to $12.00. You want to leave a tip that is about 15% of the bill. About how much should you leave for a tip?
$\frac{15}{100} = \frac{x}{12}$ $1.80

3.) If a $450 suit is on sale for $360, then what is the percent of change?
$\frac{x}{100} = \frac{90}{450}$ 20%

4.) Find the percent of change from $125 to $200.
$\frac{x}{100} = \frac{75}{125}$ 60%

5.) There is a 4.8% tax on a gown that costs $181.99. How much is the gown with tax?
$\frac{4.8}{100} = \frac{x}{181.99}$ TAX-$8.74 $190.73

6.) Billy bought a digital watch. The regular price was $44.20, but it was on sale for 30% off. If the sales tax was 7%, what was the final price, including tax, of the watch?
$\frac{30}{100} = \frac{x}{44.20}$ DISCOUNT-13.26 SALE PRICE-30.94 TAX-2.17 $33.11

7.) Tax on a $24 item is $1.56. What is the tax rate (percent)?
$\frac{x}{100} = \frac{1.56}{24}$ 6.5%

MEASUREMENT CONVERSIONS
CUSTOMARY

Length	Weight	Volume
1 foot (ft) = 12 inches (in)	1 pound (lb) = 16 ounces (oz)	1 cup (c) = 8 fluid ounces (fl oz)
1 yard (yd) = 3 feet (ft)	1 ton(T) = 2000 pounds (lb)	1 pint (pt) = 2 cups (c)
1 mile (mi) = 5280 feet (ft)		1 quart (qt) = 2 pints (pt) = 32 (fl oz)
		1 gallon (gal) = 4 quarts (qt)

Try some:

1.) 7 ft = 84 inches
$\frac{1\text{ ft}}{12\text{ in}} = \frac{7\text{ ft}}{x}$

2.) 11 yd = 33 ft
$\frac{1\text{ yd}}{3\text{ ft}} = \frac{11\text{ yd}}{x}$

3.) 2 mi = 10560 ft
$\frac{1\text{ mi}}{5280\text{ ft}} = \frac{2\text{ mi}}{x}$

4.) 9 qt = 18 pt
$\frac{1\text{ qt}}{2\text{ pt}} = \frac{9\text{ qt}}{x}$

5.) 27 ft = 9 yd
$\frac{1\text{ yd}}{3\text{ ft}} = \frac{x}{27\text{ ft}}$

6.) 11 pt = 22 cups
$\frac{1\text{ pt}}{2\text{ c}} = \frac{11\text{ pt}}{x}$

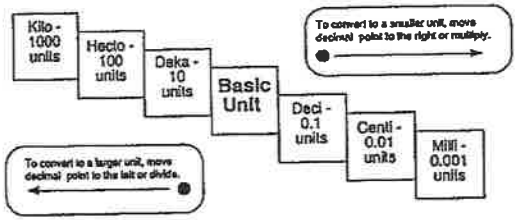
7.) 2 gal = 8 qt
$\frac{1\text{ gal}}{4\text{ qt}} = \frac{2\text{ gal}}{x}$

8.) 19 cups = 4.75 qt
$\frac{1\text{ qt}}{4\text{ c}} = \frac{x}{19\text{ c}}$

9.) 20 hours = 1200 minutes
$\frac{1\text{ hour}}{60\text{ min}} = \frac{20\text{ hr}}{x}$

MEASUREMENT CONVERSIONS
METRIC

Metric Conversion Chart



KHDUDCM

Length	Weight	Volume
Meters	Grams	Liters

Try some:

1.) 9 km = 9000 m

2.) 256 cm = 2.56 m

3.) 3.27 m = 3270 mm

4.) 4 L = 4000 mL

5.) 5,600 mL = 5.6 L

6.) 12 mm = 0.012 km

12000000

MEASUREMENT CONVERSIONS
MIXED

1. How many metric tons does a 2 ton elephant weigh? (1 ton = 90.07 metric ton)
$\frac{1\text{ T}}{90.07\text{ m}} = \frac{2}{x}$ 180.14 m tons

2. A marathon is 20 km. How many miles is the marathon? (1 km=1.06 miles)
$\frac{1\text{ km}}{1.06\text{ mi}} = \frac{20\text{ km}}{x}$ 21.2 mi

3. Billy wants to ride a roller coaster. A sign says he must be 138 cm tall. He is 55 inches tall (1 inch = 2.54 cm) Is he tall enough?
$\frac{1\text{ in}}{2.54\text{ cm}} = \frac{x}{138\text{ cm}}$ Yes

4. How many miles are in a 5,000 meter race? (1 meter=0.0006 miles)
$\frac{1\text{ m}}{.0006\text{ mi}} = \frac{5000}{x}$ 3 miles

5. If a recipe calls for 4 cups of milk and you have 1 L will it be enough? (1Liter = 4.22 cups) Explain.
$\frac{1\text{ L}}{4.22\text{ c}} = \frac{x}{4\text{ c}}$ Yes

6. Jimmy wants to buy 4 pounds of potatoes, but the supermarket only sells potatoes as kilograms. How many kilograms of potatoes should Jimmy buy? (2.2 pounds=1 kilogram)
$\frac{1\text{ kg}}{2.2\text{ lb}} = \frac{x}{4\text{ lb}}$ 1.82 kg

7. There are 5 liters of water in a recipe for brownies. Stephanie only has measuring cups. How many 1 cup measuring cups should she use? (1 cup = 1/4 liters)
$\frac{1\text{ C}}{.25\text{ L}} = \frac{x}{5\text{ L}}$ 20 cups

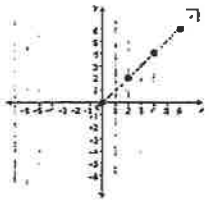
Are they proportional?

How to tell if a relationship is proportional

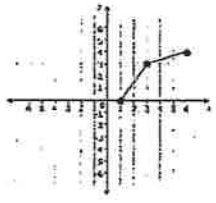
From a Graph:

- A straight line is formed
- It starts at the origin (0,0)

Example



Non-example



From a Table:

- The cross products are equal
- All ratios simplify to the same ratio

Example

1st #	2	3	5	8	12
2nd #	1	1.5	2.5	4	6

Non-example

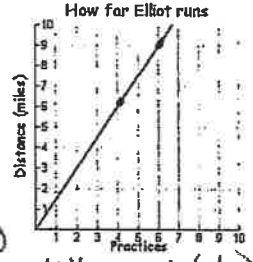
1st #	0	3	4	8	12
2nd #	2	5	6	10	14

ARE THEY PROPORTIONAL?

Look at each graph and select 2 ordered pairs (not including the origin) make a table that corresponds to the graph. Decide if the graph is proportional or not.

Graph #1

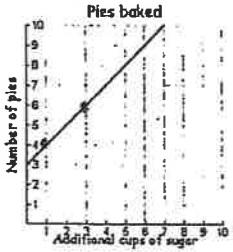
Practices	Distances
4	6
6	9



Proportional? Yes Why? Straight line through (0,0) Ratios are the same (4/6 and 6/9)

Graph #2

Cups of Sugar	Number of Pies
1	4
3	6

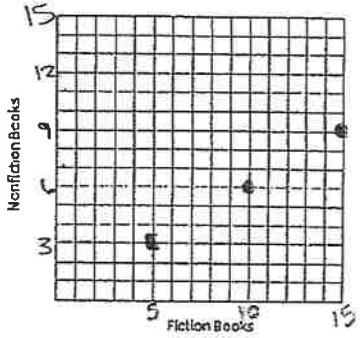


Proportional? NO Why? The line does not go through (0,0) the ratios are not equal ($\frac{1}{4} \neq \frac{3}{6}$)

1) Complete the table and graph for the following situation:

The library has 5 fiction books for every 3 nonfiction books.

Books in the Library	
Fiction	Nonfiction
5	3
10	6
15	9



2) The table below shows the cost for varying number of iTunes albums. If the relationship stays the same, determine the value of *n*.

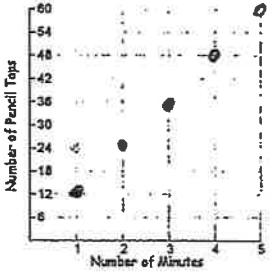
Number of iTunes albums	Cost
4	$24
5	$30
12	$72
20	*n*

n = $120

3) Let's say you are asked to *tap your pencil at a rate of 12 taps per minute.*

a) Fill in the table based on the information given above.

Number of minutes	Number of taps
1 minute	12 taps
2 minutes	24
3 minutes	36
4 minutes	48
5 minutes	60



b) Is there a constant rate of change in the table? Yes

c) Is the relationship between minutes and taps proportional? Yes

d) Graph the data from your table to confirm or deny your answer to c). See graph

e) Is there an equation that could represent this relationship? m = 12t

Ratios, Unit Rates, Proportions

- Ratio – comparison of two numbers

  HOW TO WRITE IT: 1) colon 13:17 | 2) using the word "to" 13 to 17 | 3) as a fraction $\frac{13}{17}$

- Unit Rate – The comparison is to one unit (Find the unit price)

  Ex. 2 liter of soda costs $1.98

$$\frac{\text{Price}}{\#\text{ Liters}} = \frac{\$1.98}{2} = \$0.99 \text{ per liter}$$

- Proportion – An equation that shows two equivalent ratios. (Cross products in proportions are equal)

Ex. $\frac{3}{4} = \frac{6}{8}$

Solve for the variable: A) $\frac{y}{9} = \frac{2}{3}$ $y = 6$ $3y = 18$ B) $\frac{5}{6} = \frac{20}{x}$ $x = 24$ $5x = 120$

1.) The ratio of stars to moons is 5 to 7. If we increase the number of stars to 15 and want to keep the same ratio, how many moons will we need?

$\frac{\star}{\text{C}} : \frac{5}{7} = \frac{15}{x}$ 21 moons

2.) The ratio of cookies to cupcakes is 3 to 4. If we want to increase the number of cupcakes to 32, how many cookies will we need?

$\frac{\text{c}}{\text{cc}}$ $\frac{3}{4} = \frac{x}{32}$ 24 cookies

3.) At the store an 8 ounce bag of candy costs $1.84. A 6 ounce bag of candy $1.50. Which bag of candy is the better deal?

$\frac{\$1.84}{8} = \frac{\$.23}{1}$ $\frac{\$1.50}{6} = \frac{\$.25}{1}$ 8 ounce for $1.84

4.) Mary earns $39.00 for 3 hours of yard work. Amanda earns $23.00 for 2 hours of yard work. Who makes more money per hour? Mary

→ $13 $11.50

5.) $\frac{3}{4} = \frac{m}{16}$ $4m = 48$ $m = 12$

6.) $\frac{y}{3} = \frac{9}{27}$ $27y = 27$ $y = 1$

7.) $\frac{12}{y} = \frac{3}{5}$ $3y = 60$ $y = 20$

8.) $\frac{2}{7} = \frac{14}{x}$ $2x = 98$ $x = 49$

EOG Style Questions

1. If you paid $2.95 for 2.5 pounds of apples, what was the cost per pound?

A)$0.98 B)$1.90 [C)$1.18] D)$5.90

2. You pay $7 for 8 postcards. At that rate, how much would you pay for 20 postcards?

A)$15.00 [B)$16.50] C)$17.00 [D)$17.50]

$\frac{\$7}{8} = \frac{x}{20}$

3. Your bill at a restaurant is $39.75. You want to leave a tip of about 15%. What is a good estimate of the tip?

[A)$6] B)$5 C)$4 D)$3 $5.96

4. There are 425 students enrolled at the Davis Drive Middle School. On Monday, 16% of the students enrolled were on a field trip. How many students were on the field trip?

A)16 B)136 [C)68] D)357 $\frac{16}{100} = \frac{x}{425}$

5. Jake sold 42 tickets to the school fair and Jeanne sold 9 tickets. What is the ratio, in simplest form, of the number of tickets Jeanne sold to the number of tickets Jake sold?

A) 14:3 B)42:9 [C)3:14] D)9:42

$\frac{9}{42}$

6. Susan answered 21 out of 25 questions on a mathematics test correctly. Which is the decimal equivalent of this ratio?

[A) 0.84] B)0.25 C)0.21 D)0.16

7. Zack's class responded to a survey on favorite foods. 2/3 of the class liked pizza. 5/6 of the class liked spaghetti, and 2/7of the class liked tacos. Which food did most of the students choose as their favorite?

[A) spaghetti] B)pizza C)tacos D)all are equal

$\frac{2}{3} = 0.\overline{6}$ $\frac{2}{7} = .28$ $\frac{5}{6} = .8\overline{3}$

8. Change 0.28 to a percent.

[A) 28%] B)2.8% C)0.28% D)280%

9. Change 3/8 to a percent.

A) 3.75% B)11% C)0.38% [D)37.5%]

10. During a basketball game, Kelly made 15 successful shots out of 25 tries. What was her percent of success?

A.) 10% B.) 40% C.) 50% [D.) 60%]

11. A coat that regularly sells for $58.50 is on sale for 25% off the regular price. What is a good estimate of the amount you will save off the regular price?

(A) $15 B) $35
C) $25 D) $45

$\frac{x}{60} = \frac{25}{100}$

12. Tom finished 1/3 of the 30 problems assigned in class. Steven did 3/10 of the problems. Juan finished 20% of the problems. Marcus completed 8 out of 30 problems. Who completed the most problems?

(A) Tom 10 B) Juan 6
C) Stephen 9 D) Marcus 8

13. What is 15% of 220?

A) 3.3 (B) 33
C) 330 D) 3,300

$\frac{x}{220} = \frac{15}{100}$

14. Jane has read 70% of the books on her book case. If she has read 28 books, how many books are on her book case? (part → whole)

A) 19 B) 30
C) 20 (D) 40

$\frac{28}{x} = \frac{70}{100}$

15. Pat is buying new roller skates that cost $59.99. The sales tax rate is 7%. About how much will the total cost of the skates be?

A) $4.20 (B) $64.20
C) $42.00 D) $106.00

$60(.07) = 4.20$

$60 + 4.20 =$

$\frac{3 ft}{1 yd} = \frac{x}{18 yd}$

16. How many feet is 18 yards equal to?

(A) 54 ft B) 648 ft
C) 54 yds D) 3 yds

17. DJ Kool is a disc jockey who charges the same amount for each hour. For a 4-hour dance, he charges $522. How much does DJ Kool charge for a 7-hour dance?

A) $298.29 (B) $913.50
C) $2088.00 D) $3654.00

$\frac{4}{522} = \frac{7}{x}$

18. Lauren made 15 cups of lemonade by mixing lemon juice and sugar water. The ratio of lemon juice to sugar water is 2 : 3. How many cups of lemon juice are in the lemonade?

(A) 6 cups B) 9 cups
C) 10 cups D) 22.5 cups

Lemon juice : All $\frac{2}{5} = \frac{x}{15}$

19. What is the constant of proportionality (rate) in this table?

x	2	3	4	5
y	4.8	7.2	9.6	12

$\frac{y}{x}$

A) 3/2 B) 2.8
(C) 2.4 D) 1.5

20. At GHHS, 456 students attended prom. This is 65 more students than the previous year. To the nearest percent, what is the percent of increase from last year to this year?

A) 12% B) 15%
(C) 17% D) 19%

Last yr: 456 − 65 = 391 (original)

This yr: 456

$\frac{\text{difference}}{\text{original}} \times 100$

$\frac{65}{391} \times 100$

21. The table below shows the amount of money that Bonnie spent during her last trip to Target.

Target Purchases	
Clothing	$56
Groceries	$82
School Supplies	$16

To the nearest percent, what percent of the total did she spend on groceries?

A) 10% B) 36%
(C) 53% D) 88%

$\frac{82}{154}$

22. The Titus Widget Company expects for its employees to build 5 widgets every 30 minutes. The illustration below shows the production of the four employees of Titus Widget Company on Monday. 10 w / 1 hr

Employee	Widgets Built	Hours Worked
Stacy	55	5.5
Theresa	40	4
Michael	40	8
Lionel	35	3.5

Which employee did not keep up with the expected rate?

A) Stacy B) Theresa
(C) Michael D) Lionel

23. Convert 0.5 kL to mL.

A) 500 mL B) 0.0005 mL
C) 5000mL (D) 500000 mL

(K) h d (u) d c m

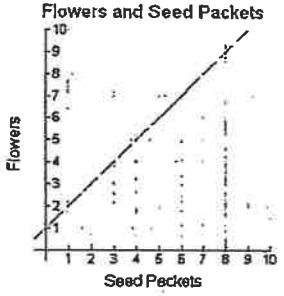
5 0 0 0 0 0

24. The following table represents a proportional relationship between the number of bagels purchased and the cost. Which equation can be used to find the cost for 13 bagels?

# of Bagels	Cost
1	.75
2	1.50
3	2.25
4	3.00

A) $c = 1 - .75b$ (B) $c = .75b$
C) $c = 13(.75b)$ D) $b = .75c$

25. Is the total number of flowers in the garden proportional to the number of seed packets used? Use the letter that best represents your answer on the final answer line.



A) It is NOT proportional because it is not a line and does not go through the origin.
(B) It is NOT proportional because although it is a line, it does not go through the origin.
C) It is proportional because it is a line and it goes through the origin.
D) It is proportional because it is a line and it does not matter if it goes through the origin.