Name: KEY Period: _____ Date: _____

Ratio, Rates and Proportional Relationships
REVIEW SHEET

Write the ratio as a fraction in simplest form.

1) 10 to 26

a. $\frac{5}{13}$ b. $\frac{13}{5}$

c. $\frac{10}{26}$ d. $\frac{10}{13}$

$\frac{10 \div 2}{26 \div 2} = \frac{5}{13}$

2) $\frac{48}{60}$

a. $\frac{12}{20}$ b. $\frac{16}{20}$

c. $\frac{4}{5}$ d. $\frac{12}{15}$

$\frac{48 \div 12}{60 \div 12} = \frac{4}{5}$

Are the following ratios equivalent? SHOW PROPORTIONS FOR FULL CREDIT!

3) a. 5:4 and 10:20

$\frac{5}{4} \overset{?}{=} \frac{10}{20}$ $40 \neq 100$ NO

b. 3:2 and 12:8

$\frac{3}{2} \overset{?}{=} \frac{12}{8}$ $24 = 24$ yes

Find the unit rate.

4) a.) 40 notecards in 5 boxes.

$\frac{40}{5} = \frac{8 \text{ notecards}}{1 \text{ box}}$

b.) 3.25 pounds for $4.20

$\frac{\$4.20}{3.25} = \$1.29/\text{pound}$

CASH IS KING!!

Solve the proportion.

5) $\frac{2}{7} = \frac{a}{35}$

$\frac{7a}{7} = \frac{70}{7}$

$a = 10$

a. 8 b. 10

c. 14 d. 5

6) $\frac{x}{16} = \frac{55}{80}$ $80x = 880$ $x = 11$

a. 20 b. 15

c. 12 d. 11

7) $\frac{84}{108} = \frac{k}{9}$ $108k = 756$ $k = 7$

a. 3 b. 7

c. 6 d. 4

8) Find the value of x for each proportion:

a.) $\frac{4}{x-2} = \frac{12}{51}$ $12(x-2) = 204$ $12x - 24 = 204$ $x = 19$

b.) $\frac{7}{9} = \frac{n}{n-10}$ $9n = 7(n-10)$ $9n = 7n - 70$ $n = -35$

SET EXPRESSION ASIDE IN PARENTHESIS

What is the ***constant of variation*** for each direct proportion?

$\frac{y}{x} = k$ (constant of Variation)

9) a.) $y = 36$ and $x = 9$? $\frac{36}{9} = 4$

$y = mx$

Revenue = Price x Quant

b.) Revenue = \$123 and $n = 41$ $\frac{\$123}{41} = \$3$

10) Which equations represent direct proportion? $y = mx$

a) $y = 4x - 2$ b) $y = 3x$

c) $y + x = 0$ d) $y = 1$

Word Problems

11) A national forest service wanted to estimate the number of deer in a particular national park. They caught and tagged 61 deer and released them back into the park. Later they selected a sample of 165 deer. Of the 165 deer, 11 were tagged. Assuming that the proportion of tagged deer in the sample holds for all deer in the forest, estimate the number of deer in the park. *Round to the nearest* ***hundred.***

a. 300

b. 900

c. 20,100

d. 600

	Sample	Total
Tagged	11	61
Total	165	x

$\frac{1006.5}{11} = \frac{11x}{11}$

$915 = x$

12) A worker in an assembly line takes 5 hours to produce 22 parts. At that rate, how many parts can she produce in 10 hours? Set up a proportion and solve.

a. 44 parts

b. 220 parts

c. 55 parts

d. 88 parts

$\frac{5\ hrs}{22\ parts} = \frac{10\ hrs}{x}$

$\frac{220}{5} = \frac{5x}{5}$

$44 = x$

13) While attending a school carnival, you estimate the ratio of children to adults as 3:2. If there are 450 people at the carnival, about how many children are in attendance?

C A

Children	3
Adults	2
Total	5

C $\frac{3}{5} = \frac{x}{450}$ C

T T

$\frac{5x}{5} = \frac{1350}{5}$

$x = 270$

14) Quality control is very important for manufacturers of products. Every day, Computek takes a random sample of 225 memory chips to see if the chips meet their minimum speed ratings for certain operations. On a particular day, 3 of the chips failed to meet the company's minimum speed test. If a total of 15,000 chips were produced that day, estimate the number of memory chips that are likely to MEET the minimum speed test. *Round your answer to the nearest ten.* Assuming the defect rate taken on the sample, how many chips do you expect to fail the test?

Fail 3
Meet 222
TOTAL 225

Fail / TOTAL = FAIL / TOTAL

$\frac{3}{225} = \frac{x}{15000}$

$\frac{225x}{225} = \frac{45000}{225}$

$x = 200$

How many chips are likely to **MEET** the minimum speed test.

TOTAL 15000
- FAIL - 200
MEET 14,800

or

$\frac{\text{MEET}}{\text{TOTAL}} = \frac{222}{225} = \frac{x}{15000}$

$\frac{225x}{225} = \frac{3330000}{225}$

$x = 14800$

15) Four ounces of breakfast shake provide 5 grams of protein. How many ounces of the product would be needed to provide 75 grams of protein?

$\frac{4oz}{5gram} = \frac{x}{75gram}$

$\frac{5x}{5} = \frac{300}{5}$

$x = 60$

16) Jamie traveled 472.5 miles on 31.5 gallons of gas. How many miles can she travel on 9.03 gallons of gas?

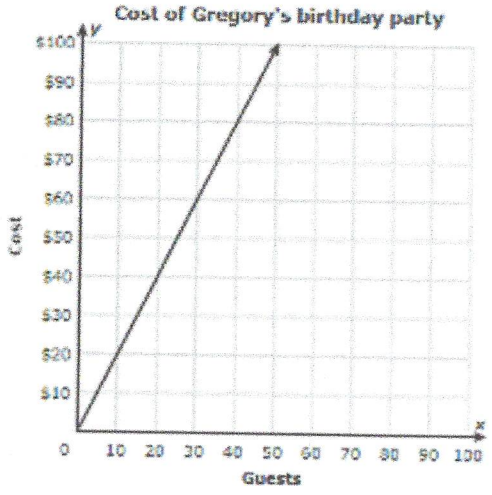
$\frac{472.5 miles}{31.5 gal} = \frac{x}{9.03 gal}$

$\frac{4266.675}{31.5} = \frac{31.5x}{31.5}$

$135.45 miles = x$

Interpreting tables and graphs

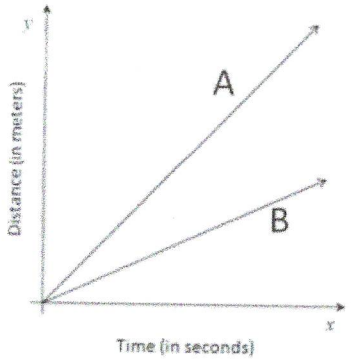
17) Does the following graph represent a direct proportion? (Yes/No) Yes.



Explain.

Because the graph passes through the origin it is A proportional relationship

18) The graph below show the distance two cars have traveled along the freeway over a period of several seconds. Car A is traveling at 30 meters per second.



A is going FASTER THAN B Because graph is steeper!!

Which equation from those shown below is the best choice for describing the distance traveled by car B after x seconds?

a. $y = 85x$

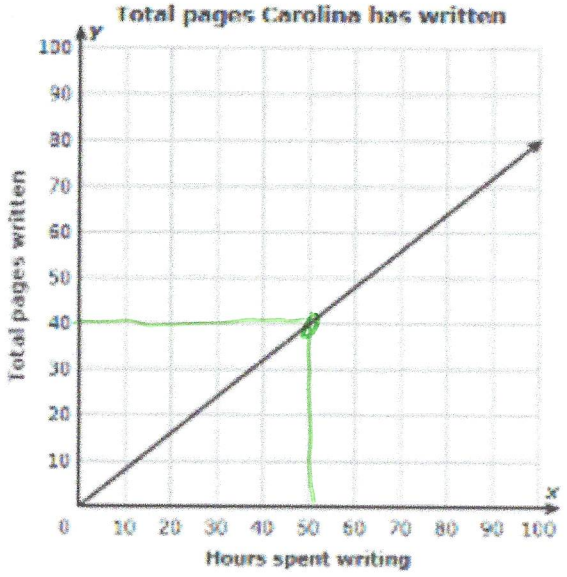
b. $y = 60x$

c. $y = 30x$

d. $y = 15x$

IF A is 30 mps which equation has a lower rate??

19) Determine if the graph is a direct proportion.(Yes/No) Yes.



Explain what the rate of change represents in this situation.

$\frac{40 \text{ pages}}{50 \text{ hours}} = \frac{4 \text{ pages}}{5 \text{ hrs.}}$

Carolina has written 4 pages in 5 hours.

20) Determine if the chart below represents a direct proportion. (Yes/No) Yes.

Total kilometers Matt has walked

Number of trips, x	8	25
Total distance walked (kilometers), y	8	25

$\frac{8}{8} = 1 \quad \frac{25}{25} = 1$

21) Kelly works at an after-school program at an elementary school. The table below shows how much money she earned every day last week.

	Monday	Wednesday	Friday
Time worked	1.5 hours	2.5 hours	4 hours
Money Earned	$12.60	$21.00	$33.60
	$8.40/hr	$8.40/hr	$8.40/hr

Mark has a job mowing lawns that pays $7 per hour.

a.) Is Kelly's pay directly proportional to the number of hours she works? (Y/N)
Explain.

Yes each of the ratios of $\frac{y}{x}$ $\left(\frac{\text{money}}{\text{hours}}\right)$ is the same $8.40/1 hour

b.) Who would make more money for working 10 hours? Explain or show work.

Kelly would make more $10 \times 8.40 = \$84$

Mark would make $10 \times 7 = \$70$

c.) Sketch the graph of Kelly's earnings, y, for working x hours.
On same axes below, sketch the amount of money, y, Mark would make for working x hours.

Kelly's earning

x	y
1	8.40
2	16.80
3	25.20
4	33.60
5	42
6	50.40
7	58.80

MARK

7
14
21
28
35
42
49

d.) How can you see who makes more money per hour just by looking at the graphs? Explain.

KELLY WOULD MAKE MORE BECAUSE HER GRAPH IS STEEPER (ABOVE) MARKS GRAPH.