

2.5 Ratios and Direct Variation

Name:

Date:

Goal: I can solve direct variation problems

Direct Variation: when 2 quantities have a constant ratio

$\frac{y}{x} = \frac{kx}{x}$ k is your constant $k = \frac{y}{x}$ $y = kx$

1. The number of Calories varies directly with the mass of the cheese. If there are 200 Calories in 50 grams of cheese, how many calories are in 70 grams of cheese?

$k = \frac{\# \text{ of Calories}}{\text{mass of cheese}}$

$\frac{200 \text{ calories}}{50 \text{ grams}} = \frac{x \text{ calories}}{70 \text{ grams}}$

$70 \cdot \frac{200}{50} = \frac{x}{70} \cdot 70$
 $280 = x$

In 70 grams of cheese there are 280 calories

2. You can download a 5MB file in 2 seconds. How long will it take you to download a 13 MB file?

$x \cdot \frac{5 \text{ MB}}{2 \text{ sec}} = \frac{13 \text{ MB}}{x \text{ sec}}$

$x \cdot \frac{5}{2} = \frac{13}{x} \cdot x$

$\frac{5x}{2} = 13 \cdot 2$
 $\frac{5x}{5} = \frac{26}{5}$
 $x = 5.2 \text{ sec}$

It will take 5.2 sec. to download a 13 MB file.

3. The ratio of male to female students at a local college is 5 to 6.

a. If there are 1000 female students enrolled, how many male students are enrolled?

$\frac{5 \text{ male}}{6 \text{ female}} = \frac{x \text{ male}}{1000 \text{ female}}$

$1000 \cdot \frac{5}{6} = \frac{x}{1000} \cdot 1000$

$\frac{5000}{6} = x$

$x = 833.333$
 833 males are enrolled in a local college

b. If there are f female students in the college and m male students in the college, write an equation for m in terms of f .

$\frac{5 \text{ male}}{6 \text{ female}} = \frac{m \text{ male}}{f \text{ female}}$

$f \cdot \frac{5}{6} = \frac{m}{f} \cdot f$

$m = \frac{5f}{6}$

by itself $m =$

c. Fill in the following table to determine the number of male and female students in the school.

Female Students	Male Students
f	m
1000	833
2000	1667
5000	4167
7500	6250
8000	6667
10000	8333

$m = \frac{5f}{6}$

of male students (in thousands)

Variable	Lower Bound	Upper Bound	Interval
Female stud.	0	10,000	1000
Male stud.	0	15,000	1000

