

Name: _____ Block: ____ Date: _____

MATH 6/7 NOTES & PRACTICE

Unit 9 Notes: Proportions

A **proportion** is an equation stating that two ratios (fractions) are equal.

- If the cross products are equivalent, the two ratios form a proportion.
- If the cross products are not equal, the ratios **DO NOT** form a proportion.

Examples:

Determine whether each pair of ratios forms a proportion.

A) $\frac{1}{3}, \frac{3}{9}$

B) $\frac{1.2}{4}, \frac{2}{5}$

Independent Practice: Determine if each pair of ratios are equivalent.

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| 1) $\frac{2}{3}, \frac{8}{12}$ | 2) $\frac{4}{2}, \frac{18}{7}$ |
| 3) $\frac{1.5}{5}, \frac{3}{9}$ | 4) $\frac{2.1}{3.5}, \frac{3}{7}$ |
| 5) $\frac{5.3}{15.9}, \frac{2.7}{8.1}$ | 6) $\frac{18}{2.4}, \frac{15}{2}$ |

If a proportion contains a *variable*, use cross multiplication and single-step algebra to find the missing value.

Examples: Solve the proportion.

A) $\frac{a}{25} = \frac{52}{100}$

B) $\frac{12.5}{m} = \frac{15}{7.5}$

Solving Proportions

- 1) Write a proportion
 - 2) Cross Multiply
 - 3) Simplify
 - 4) Divide to isolate the variable
- ✓ The cross products of two ratios must be equal if the two ratios form a proportion

Independent Practice: Solve each proportion.

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| 1) $\frac{k}{35} = \frac{3}{7}$ | 2) $\frac{3}{t} = \frac{18}{24}$ |
| 3) $\frac{10}{8.4} = \frac{5}{m}$ | 4) $\frac{p}{6} = \frac{24}{36}$ |
| 5) $\frac{2}{15} = \frac{c}{72}$ | 6) $\frac{2}{9.4} = \frac{0.2}{v}$ |
| 7) $\frac{a}{0.28} = \frac{4}{1.4}$ | 8) $\frac{16}{x+5} = \frac{4}{5}$ (distributive property) |

Proportions can be used to solve real-world problems.

Solving Practical Problems Using Proportions

- 1) Set-up the proportion using WORDS
- 2) Set-up the proportion with known values
- 3) Cross multiply
- 4) Solve



You must **compare similar units of measure** in order to solve properly!

Examples:

1) Sam ran 4 miles on Saturday with his running club. How far did he run in kilometers if there are approximately 1.61 kilometers in each mile?

2) A recipe calls for 12 ounces of fruit juice for every 40 ounces of soda. How much soda should you use if you use 16 ounces of fruit juice?

Independent Practice:

Directions: Write a proportion that could be used to solve for each variable, then solve. Round to the nearest hundredth.

1) If there are 8 pencils in 2 boxes, how many pencils will fit into 5 boxes?

2) If 5 quarts of juice costs \$6.25, how many quarts of juice can you buy with \$8.75?

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| 3) If there are 3.28 feet in a meter, how many feet are in the 110 meter dash? | 4) A photograph is 3 inches wide by 5 inches long. If the photograph is enlarged so that the length is 7 inches, how wide is the enlarged photo? |
| 5) If 1 pint of paint is need to paint a square that is 5 feet on each side, how many pints are needed to paint a square that is 9 feet on each side? | 6) The world's largest baseball bat is 120 feet long. If there are 30.28 centimeters in a foot, find the length of the bat in centimeters. |

Currency Exchange Rates

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| 1) Ming is planning a trip to Western Samoa. The exchange rate is 6 Tala for \$2. How many Tala will she get if she exchanged \$6? | 2) The money used in Jordan is called Dinar. The exchange rate is \$3 to 2 Dinars. Find how many dollars you would receive if you exchanged 22 Dinars? |
| 3) Jenny is planning a trip to the United Arab Emirates. She learned that the exchange rate is 4 Dirhams for every dollar. How many Dirhams would she get if she exchanged \$7? | 4) Asanji took a trip to Mexico. Upon returning to the US he converted his Pesos back to dollars. How much did he receive in dollars if he exchanged 42.7 Pesos at a rate of $\$5.30 = 11.1$ Pesos? Round your answer to the nearest cent. |

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| 5) The currency in Argentina is the Peso. The exchange rate is approximately $\$3 = 1$ Peso. At this rate, how many Pesos would you get if you exchanged \$121.10? Round your answer to the nearest tenth. | 6) The money in Peru is called the Nuevo Sole. The exchange rate is \$8.80 for one Nuevo Sole. How many dollars would you receive if you exchanged 32.4 Nuevos Soles? |
| 7) The currency in Tajikistan is Somoni. The exchange rate is approximately 1 Somoni for every \$9.70. At this rate, how many Somoni would you get if you exchanged \$436.60? Round your answer to the nearest tenth. | 8) The money used in the Eastern Caribbean Islands is called the Eastern Caribbean Dollar. The exchange rate is \$4 to one Eastern Caribbean Dollar. How many Eastern Caribbean Dollars would you receive if you exchanged \$162.60? |

Shapes

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| 9) Shawna reduced the size of a rectangle to a height of 2 inches. What is the new width if the original rectangle had a width of 24 inches and a height of 12 inches? | 10) Nicole reduced the size of a photo to a width of 4.6 inches. What is the new height if it was originally 9.4 inches tall and 9.2 inches wide? |
| 11) A triangle is 20 inches in height and has a base of 5 inches wide. If the base is reduced to a width of one inch, how tall will it be? | 12) A frame is 9 inches wide by 6 inches tall. If the width is reduced to 3 inches, what is the new length of the frame? |

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| 13) A painting is 2 feet wide by 3 feet long. If it is enlarged to a width of 15 feet, what is the new length? | 14) A MacBook Air is 13 inches wide by 9 inches long. If the width were increased to 18 inches, how long would it be? Round your answer to the nearest tenth. |
| 15) A rectangle has a length of 4.6 cm, and a width of 3.2 cm. If the width is enlarged to 12.8 cm, what is the new length? | 16) A photograph is 3 inches in length by 5 inches in width. If the photo is enlarged to 15 inches in length, how wide is the new photo? |

Measurement

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| 17) Preston drove to his new college and home again. The round trip was 212 miles. If there are approximately 8.05 km in 5 miles, what distance did Preston drive in km? | 18) The average weight of a 12 year old boy in the US is 45 kg. If there are 2.2046 pounds in a kg, what is the average weight in pounds? Round your answer to the nearest pound. |
| 19) A rectangle measures 9cm by 5cm. If there are approximately .79 inches in 2 cm, what are the dimensions of the rectangle in inches? Round your answers to the nearest tenth. | 20) A classroom measures 28 feet wide. If there are 16.404 feet in 5 meters, how long is the classroom in meters? Round your answer to the nearest tenth. |
| 21) The distance from the playground to the school building is 13 yards. What is the distance in inches? | 22) An iPhone 4S measures 4.5 inches in length and 2.25 inches in width. If there are about 1.18 inches in 3 centimeters, what are the dimensions of the iPhone 4S in centimeters? Round your answers to the nearest tenth. |