

Day 2: Proportion and Tangent Law

Friday, September 20, 2013 9:31 AM

AW Math 11

Name: _____

DAY 2 Proportion and Tangent Ratio class notes

Proportion

- 2 ratios (fractions) with "=" sign between them

HOW TO Solve a Proportion

Recall from Math 10 AW that we can use "cross multiply and divide" to solve for any missing values...

Examples:

1. $\frac{10}{x} = \frac{8}{4}$

$10 \times 4 \div 8 \quad x = 5$

2. $\frac{3}{2} = \frac{m}{4}$

$3 \times 4 \div 2 \quad m = 6$

3. A store buys a box of bananas for \$22.50. There are usually 50 bananas per box. What is the price per banana?

$\frac{\$22.50}{50 \text{ bananas}} = \frac{\$x}{1 \text{ banana}}$

$\$22.50 \times 1 \div 50$

$x = \underline{\$0.45}$
banana

4. Mix gas to oil in a tank at a ratio of 50:1. How much oil if you pump in 127.5 L of gas?

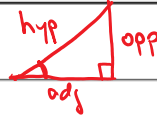
$\frac{50 \text{ Gas}}{1 \text{ oil}} = \frac{127.5 \text{ Gas}}{x \text{ oil}}$

$127.50 \times 1 \div 50$

$x = \underline{2.55 \text{ L}}$

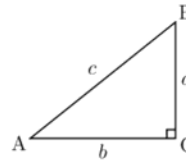
~~200~~ if you get $\frac{2 \times 100}{0.75 \times 100} = \frac{200}{75} = \frac{8}{3}$ or $\underline{8:3}$

Tangent of an Angle



$\text{tangent} = \frac{\text{opp}}{\text{adj}}$
 Calculator

tan 15°	0.2679
tan 45°	1
tan 75°	3.7320



$\tan A = \frac{a}{b}$
 $\tan B = \frac{b}{a}$

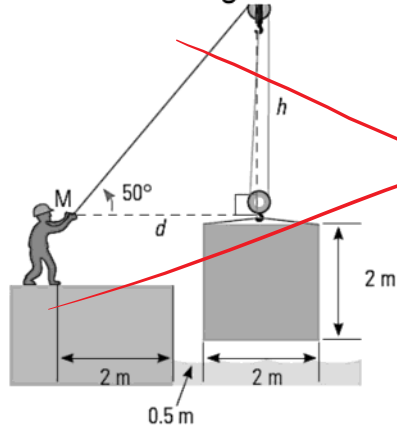
HOW TO Solve Triangles Using the Tangent Ratio

Example 1: Finding the Adjacent Side

How far is the kayaker from the base of the cliff?

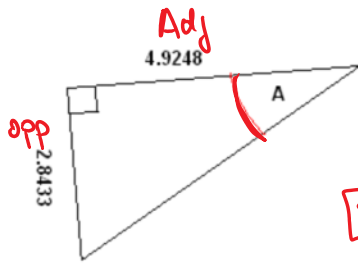
Example 2: Finding the Opposite Side

What is the length of the chain that is lifting the cargo?



~~SKIP~~

Example 3: Finding the Angle



$$\tan A = \frac{2.8433}{4.9248} \leftarrow \text{divide}$$

$$\tan A = 0.5773$$

$$\boxed{2^{\text{nd}}}$$
 $\tan, 0.5773$

$$A = 30^\circ$$

Use $\boxed{2^{\text{nd}}}$ to find angle

DAY 2 Proportion and Tangent Ratio assignment

Read problem. Write the known ratio. Set it equal to the new ratio, containing the unknown. Remember to match top and bottom units across the proportion. Use cross-multiplication to solve.

1. Shawna reduced the size of a rectangle to a height of 2 in. What is the new width if it was originally 24 in wide and 12 in tall?

2. Ming was planning a trip to Western Samoa. Before going, she did some research and learned that the exchange rate is 6 Tala for \$2. How many Tala would she get if she exchanged \$6?

$$\frac{6 \text{ tala}}{\$2} = \frac{x \text{ tala}}{\$6} \quad 6 \times 6 \div 2 = 18$$

3. If you can buy 32 kiwi fruit for \$16, how many kiwi can you buy for \$4?
4. One bunch of seedless black grapes costs \$2. How many bunches can you buy for \$20?

5. Alex's dirt bike requires 15 L of gas to be mixed with 4 L of oil. If he uses 20 L of gas, how much oil will he need? Round to the nearest tenth of litre.

6. In a juice mixture, 750 mL of water are mixed with 250 mL of juice concentrate. What is the ratio of **concentrate to water**? Put ratio in lowest terms.

$$\frac{750 \text{ W}}{250 \text{ J}} = \frac{3}{1} \quad \boxed{3:1}$$

7. A recipe for corn chowder includes 3 cups of corn, 2 cups of water, and one and a half cups of cream. If one increases the yield of the recipe and uses four and a half cups of cream, **how much corn** will be required?

8. If cereal mixture contains 6 cups of oats, 2 cups of almonds, 1 cup of raisins, and three quarters of a cup of coconut.

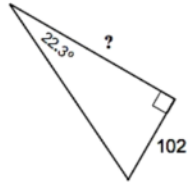
a) What is the ratio of almonds to coconut?

b) What is the ratio of oats to raisins?

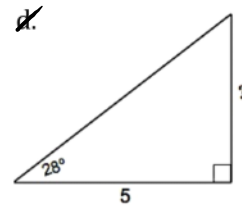
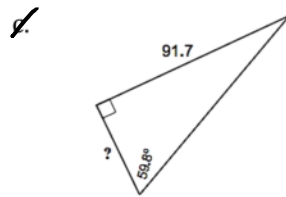
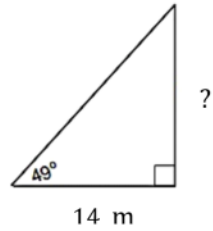
c) What is the ratio of oats to the **total ingredients in the recipe**?

9. Find the length of the indicated side of the triangles. Show your work!

a.



b.



10. Find the missing two angles of the given triangle. (Hint: Use tangent to find one of the angles. You can use angle sum in a triangle of 180° to find the 3rd angle.)

