

Name: Solutions

Date: \_\_\_\_\_

Course expectation you're working on...

Students will solve problems, including those that arise from real-world applications (e.g., surveying, navigation), by determining the measures of the sides and angles of right triangles using the primary trigonometric ratios.

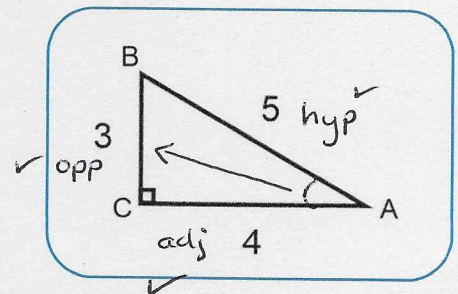
- Answer each of the following on the quiz paper in the spaces provided.
- Show each of the steps in your thinking process.
- Make sure that your calculator is in DEG (or D) mode!

1. Using angle A as your reference angle, label the *opp*, *adj* and *hyp*.

2. The sin ratio for angle A in the above triangle can be written as  $\sin A = \frac{3}{5}$ .

Write the *cosine* and *tangent* ratios for angle A.

a)  $\cos A = \frac{4}{5}$  ✓      b)  $\tan A = \frac{3}{4}$  ✓



3. Use one of the inverse trig ratios ( $\sin^{-1}$ ,  $\cos^{-1}$ , or  $\tan^{-1}$ ) and its corresponding ratio in #2 to find the measure of angle A. Round angle A to the nearest degree.

$A = \sin^{-1}(3 \div 5)$  ✓      OR       $A = \cos^{-1}(4 \div 5)$       OR       $A = \tan^{-1}(3 \div 4)$   
 $\hat{=}$   $37^\circ$  ✓       $\hat{=}$        $\hat{=}$

4. Determine the measure of the remaining angle in the given triangle—angle B.

$\angle A + \angle B + \angle C = 180^\circ$  ✓

$37^\circ + \angle B + 90^\circ = 180^\circ$

$127^\circ + \angle B = 180^\circ$

$\angle B = 180^\circ - 127^\circ$  ✓

$\angle B = 53^\circ$  ✓

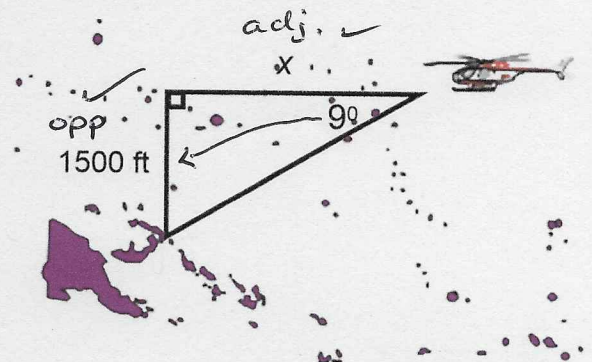
5. Consider the following scenario.

A rescue helicopter is flying horizontally at an altitude of 1500 feet over Georgian Bay toward Beau-soleil Island. The angle between the horizontal and the island is  $9^\circ$ .

a) What trig ratio (*sin*, *cos*, or *tan*) would you use to determine how much farther the helicopter must fly before it is above the island? *tan* ✓

Clearly explain your choice.

Since the opposite side length (1500 ft) is given, and the horizontal distance,  $x$ , is required (adjacent to the  $9^\circ$  angle), the tangent ratio can be used to solve for  $x$ .



(Over →)



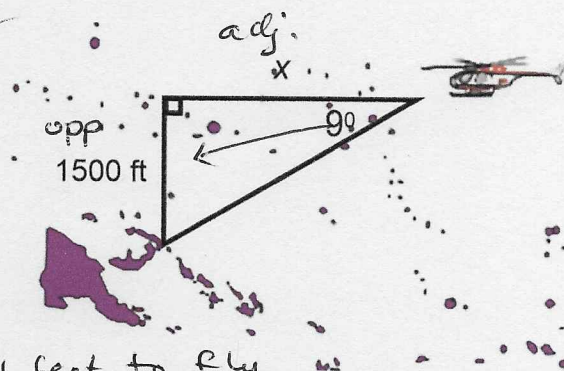
b) Calculate this distance (i.e., the horizontal distance) using the trig ratio you've chosen in a). Round your answer to the nearest foot.

$$\tan 9^\circ = \frac{1500}{x} \checkmark$$

$$x \cdot \tan 9^\circ = 1500 \checkmark$$

$$\checkmark \frac{x \cdot \cancel{\tan 9^\circ} = 1500}{\cancel{\tan 9^\circ} \quad \tan 9^\circ}$$

$$x = 9471 \checkmark$$



It has 9471 feet to fly until it is over the island.

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OR

$$\tan 9^\circ = \frac{1500}{x}$$

$$; \tan 9^\circ = \frac{0.1584}{1}$$

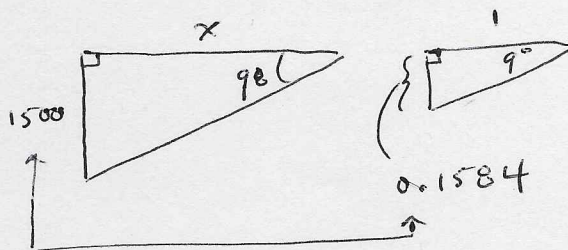
$$\frac{0.1584}{1} = \frac{1500}{x}$$

Cross-multiplying,...

$$0.1584x = 1500$$

$$\frac{0.1584x}{0.1584} = \frac{1500}{0.1584}$$

$$x = 9471$$



$$\begin{aligned} \text{scale factor} &= \frac{1500}{0.1584} \\ &= 9471 \end{aligned}$$