

Name: _____

Date: _____

MBF 3C/MAP4C

Formative Assessment: The Primary Trigonometric Ratios & Trigonometry of Obtuse Angles

(Solutions)

Expectations you're working on...

- **3C C & 4C:** 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.
- **4C only:** Students will identify an obtuse angle with the same sine [or cosine or tangent] as a given acute angle; and determine the values of the sine, cosine, and tangent of obtuse angles.

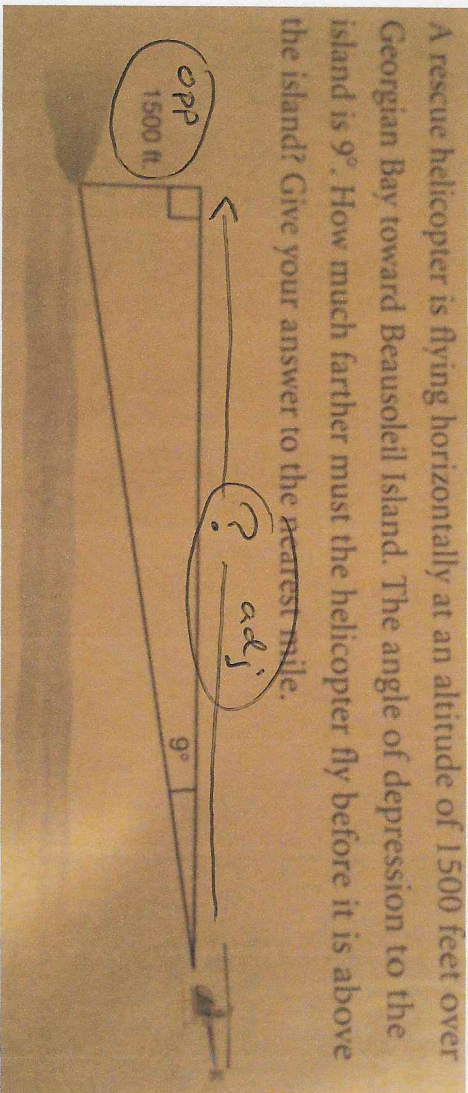
Still Learning...	Almost There...	Got It!

Part A-Knowledge & Understanding

1. **3C & 4C:** Consider the problem given (see right).
a) What trigonometric ratio would you use to solve the following problem?
tangent

b) Why did you choose this ratio? Explain.

Given the opposite length, and required to find the adjacent length, use the tangent ratio.



2. **3C & 4C:** For the problem provided (below), a student decides that they could use two, different *inverse trig ratios* to find the navigation angles—from the first to the third island and from the third to the first island.

a) Do you agree or disagree with their thinking? Disagree

b) Explain your decision in a).

The three, inverse trig ratios are \sin^{-1} , \cos^{-1} , and \tan^{-1} . The only ratio, for the given information, that can be used is \tan^{-1} .

For angle A, $\tan A = \frac{18}{12}$, so $A = \tan^{-1}\left(\frac{18}{12}\right)$

For angle B, $\tan B = \frac{12}{18}$, so $B = \tan^{-1}\left(\frac{12}{18}\right)$

3. **4C ONLY:** True or False—If the statement is false, correct the statement so that it reads correctly.

a) TRUE or FALSE? The cosine of an obtuse angle is positive. FALSE

The cosine of ... is negative.

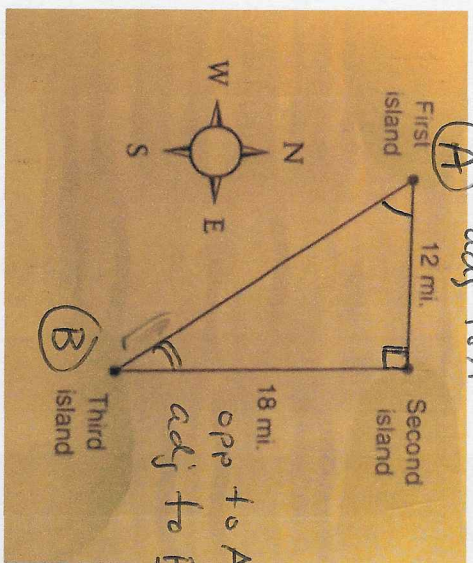
b) TRUE or FALSE? The sine of an obtuse angle is negative. FALSE

The sine of ... is positive.

4. **4C ONLY:** The following statement is true for all angle values, θ : $\sin \theta = \sin(180^\circ - \theta)$

Write a statement for $\cos \theta$ that relates the cosine of an acute angle to the cosine of its supplementary, obtuse angle.

$$\cos \theta = -\cos(180^\circ - \theta)$$

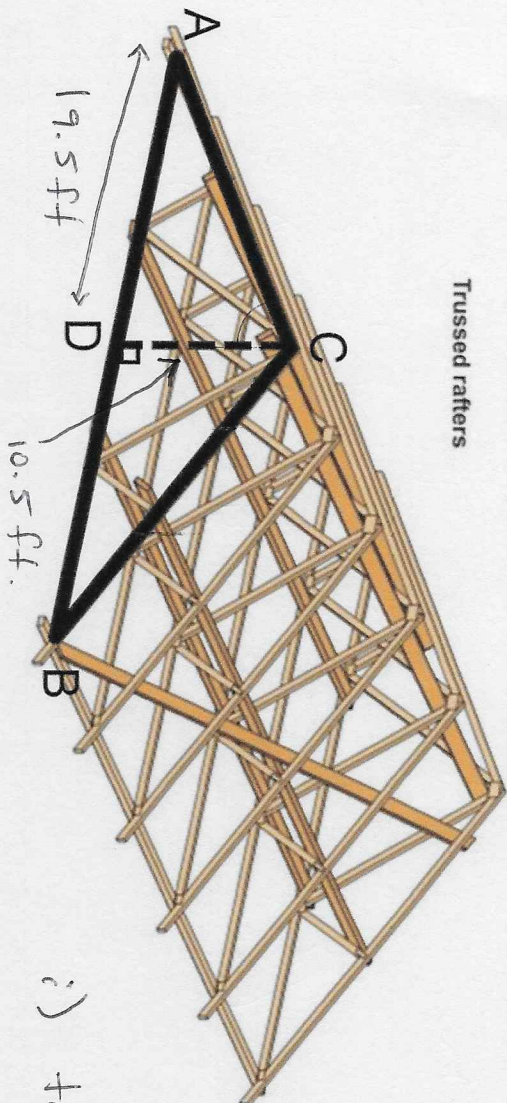


see side length labels - opp + adj.

Part B-Application & Thinking, Inquiry and Problem Solving

3. **3C & 4C:** For the trussed rafters (below), $AD = 19.5$ ft and $CD = 10.5$ ft. Write your own TWO problems about the roof. Make sure that you use the primary trigonometric ratios to solve them. Solve both of your problems.

Trussed rafters



ANSWERS WILL VARY.

Here are some suggestions:

i) Calculate the angle of inclination, $\angle A$.

ii) Calculate $\angle ACB$.

iii) Calculate the length of AC .

$$i) \tan A = \frac{10.5}{19.5} ; A = \tan^{-1} \left(\frac{10.5}{19.5} \right) \approx 28.3^\circ$$

$$ii) \tan \angle ACD = \frac{19.5}{10.5} ; \angle ACD = \tan^{-1} \left(\frac{19.5}{10.5} \right) \approx 61.7^\circ$$

$$\angle ACB = 2 \angle ACD = 2 + \tan^{-1} \left(\frac{19.5}{10.5} \right) \approx 123.4^\circ$$

$$iii) \sin A = \frac{10.5}{AC} \quad AC \approx 28.3$$

$$AC \sin A = 10.5$$

$$AC = \frac{10.5}{\sin A} \approx 22.1$$

$$\angle CAC \approx 22.1^\circ$$

Communication Corner (leave blank)