Week 3	Tuesday 3 September
Chapter Three:	Geometry and Trigonometry
Topic:	3.4 The Sine Rule
IB Syllabus:	5.3
Lesson Obj:	Students will identify when to use the Sine Rule. Students will use the Sine Rule to solve a triangle. Students will draw a triangle from given information and solve it.

Review and Intro:

0. Vocab on board: sine rule. Homework questions
1. In the last unit, we solved for parts of right triangles. Review
2. But not all triangles are right triangles... How do we solve others?

Core Lesson:

3. Prove derivation of Sine Rule with student input
4. Sine Rule: use when we know an angle AND the side opposite that angle
   Draw triangle and label. Show sine rule.
5. Example 1. Students do 2-6 at board.

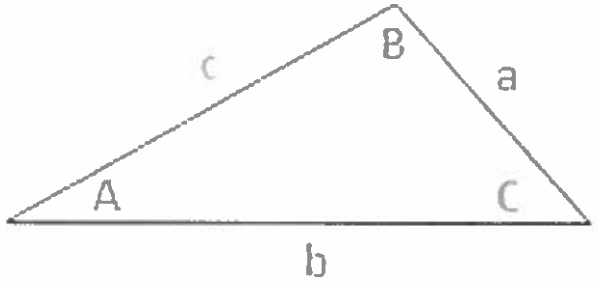
Check for Understanding:

6. Check student work throughout
7. IB Practice A, B, C

Assignment: Students will complete 121:1-8 all

IB Math Studies Year 2

3.4 The Sine Rule



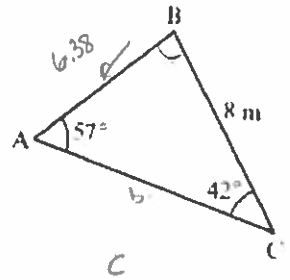
IB Math Studies Year 2

3.4 The Sine Rule

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

For each triangle, find the measure of each side and angle.

1.



$\frac{8}{\sin(57)} = \frac{c}{\sin(42)}$

$8 \cdot \sin(42) = \sin(57)c$

$5.355 = \sin(57)c$

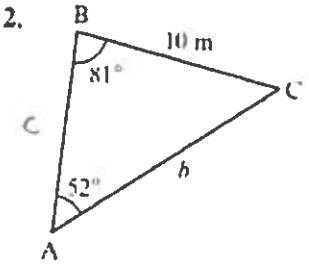
$c = 6.38$

$\hat{B} = 81°$ | $\frac{b}{\sin(81)} = \frac{8}{\sin(57)}$

$b = 6.626$

$b = 6.63$

2.



$\frac{10}{\sin(52)} = \frac{b}{\sin(81)}$

$9.8768 = \sin(52)b$

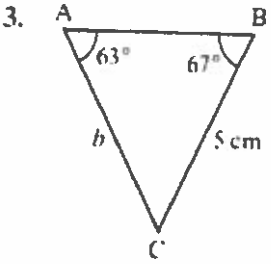
$7.783 = b$

$7.78 = b$

$\hat{C} = 47°$ | $\frac{c}{\sin(47)} = \frac{10}{\sin(52)}$

$5.76 = c$

3.



$\frac{5}{\sin(63)} = \frac{b}{\sin(67)}$

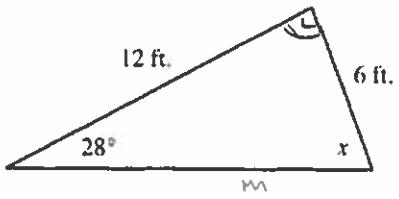
$4.100 = b$

$4.1 = b$

$\hat{C} = 50°$ | $\frac{c}{\sin(50)} = \frac{5}{\sin(63)}$

$c = 3.412$

4.



$\frac{6}{\sin(28)} = \frac{12}{\sin(x)}$

$5.633 = 6[\sin(x)]$

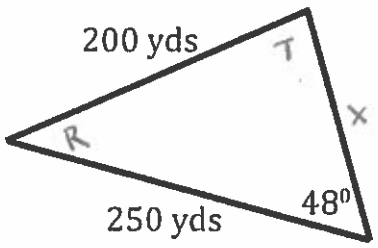
$33.801 = \sin(x)$

$69.87° = x$

$L = 82.13°$ | $\frac{x}{\sin(82.13)} = \frac{6}{\sin(28)}$

$M = 12.7$ ft

5.



$\frac{200}{\sin(48)} = \frac{250}{\sin(T)}$

$200\sin(t) = 185.786$

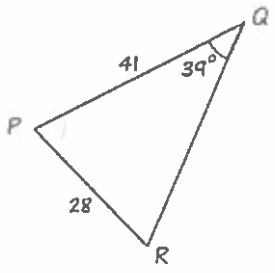
$\sin(t) = .928$

$68.3° = T$

$63.7 = R$ | $\frac{x}{\sin(63.7)} = \frac{200}{\sin 48}$

$x = 241.3$ yds

6.



$\frac{28}{\sin(39)} = \frac{41}{\sin(R)}$

$\frac{25.80}{25} = \frac{25[\sin(R)]}{25}$

$.921 = \sin(R)$

$67.1° = R$

$\hat{P} = 73.9$ | $\frac{QR}{\sin(73.9)} = \frac{28}{\sin(39)}$

$42.7 = QR$

IB Practice A

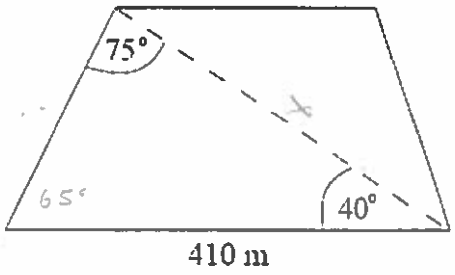
A farmer wants to construct a new fence across a field. The plan is shown below. The new fence is indicated by a dotted line. Calculate the length of the fence.

$\frac{\sin(75}{410} = \frac{\sin 65}{x}$

$371.58619 \cdot = \sin 65 \, x$

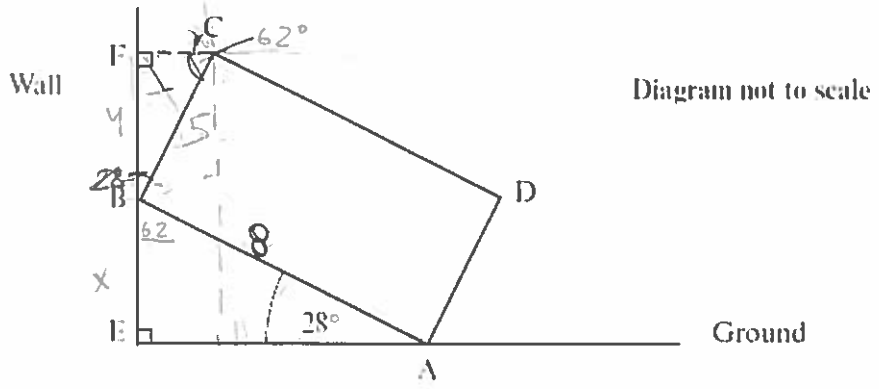
384.69

385 M = length of fence



IB Practice B

A rectangular block of wood with face ABCD leans against a vertical wall, as shown in the diagram below. AB = 8 cm , BC = 5 cm and angle $B\hat{A}E = 28°$.



Find the vertical height of C above the ground.

$\frac{\sin 90}{8} = \frac{\sin 28}{x}$ $x = 3.755$

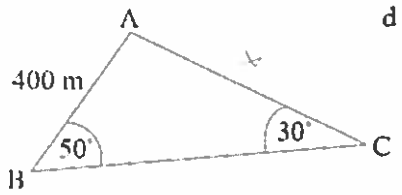
$\frac{\sin 90}{5} = \frac{\sin 62}{4}$

$4 = 4.414$

8.17 cm = height of C vertically

IB Practice C

The figure shows a triangular area in a park surrounded by the paths AB, BC and CA, where AB = 400 m, $A\hat{B}C = 50°$ and $B\hat{C}A = 30°$.



a) Find the length of AC using the above information.

$$\frac{\sin(30}{400} = \frac{\sin(50}{AC}$$

612.835

AC = 613 m

Diana goes along these three paths in the park at an average speed of 1.8 m s^{-1}.

1.8 m/s

b) Given that BC = 788 m, calculate how many minutes she takes to walk once around the park.

400 + 788 + 613 = 1801 m traveled

$$\frac{1801\text{ m}}{x\ s^{-1}} = \frac{1.8\text{ m}}{1\ s^{-1}}$$

$1801 = 1.8x$

1000.55 seconds