Today's Learning Goal(s):

Date: ____________________

By the end of the class, I will be able to:

a) solve a triangle involving the Cosine Law and obtuse angles.

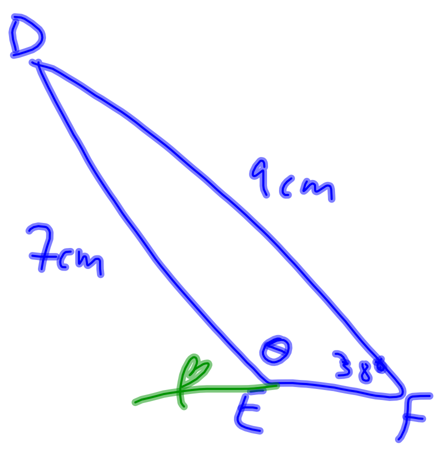
Last day's work: pp. 318-319 #1, 2, 3a, 4, 5ac, 7 [15,17]

1b, 7,

2c

p. 318

1b)



$$\frac{\sin\theta}{9} = \frac{\sin 38^\circ}{7}$$

$$\theta = \sin^{-1}\left(9 \times \frac{\sin 38^\circ}{7}\right)$$

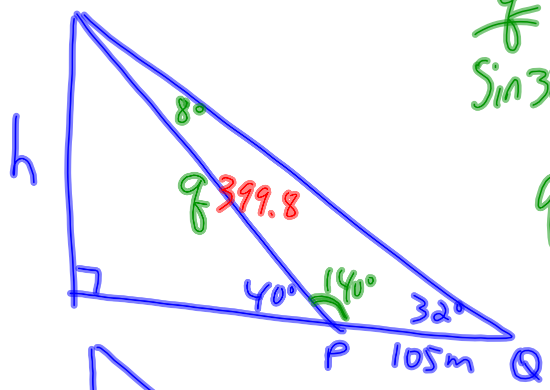
$$\beta \doteq 52.3$$

$$\doteq 52^\circ$$

$$\therefore \theta \doteq 180^\circ - 52^\circ$$

$$\doteq 128^\circ$$

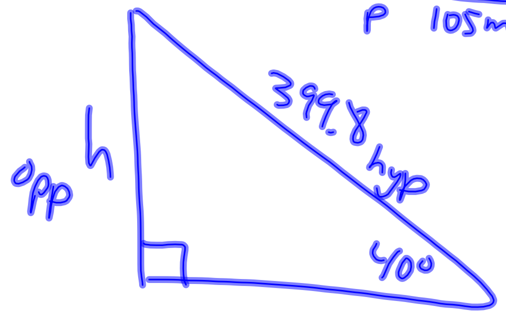
p.319
7



$$\frac{q}{\sin 32^\circ} = \frac{105}{\sin 8^\circ}$$

$$q = \sin 32^\circ \times \frac{105}{\sin 8^\circ}$$

$$\doteq 399.8\text{ m}$$



$$\sin 40^\circ \doteq \frac{h}{399.8}$$

$$h \doteq 399.8 \sin 40^\circ$$

$$\doteq 256.98$$

$$\doteq 257\text{ m}$$

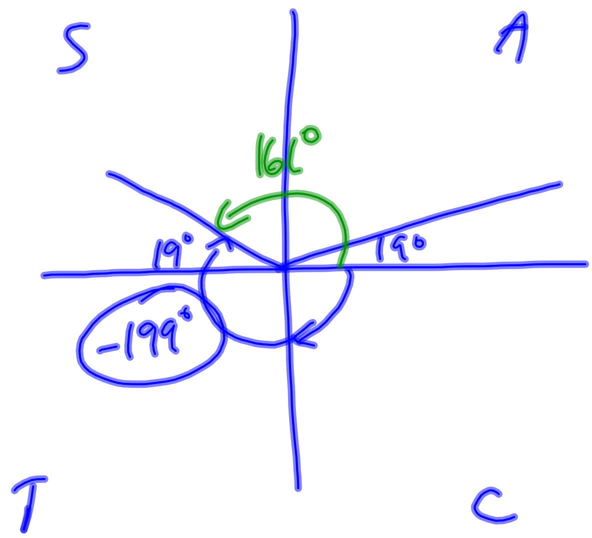
From last day

p.300 7a) $\sin\theta = \frac{1}{3}$

$$\theta = \sin^{-1}\left(\frac{1}{3}\right)$$

$$\doteq 19.47$$

$$\doteq 19^\circ$$



p.301

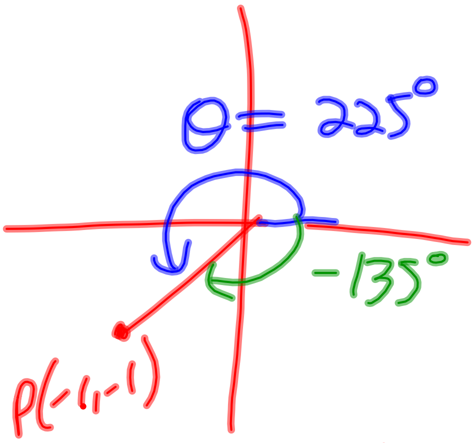
10a) $P(-1,-1)$

$r^2 = x^2 + y^2$

$= (-1)^2 + (-1)^2$

$= 2$

$r = \sqrt{2}$



$\therefore \sin\theta = \frac{y}{r}$ $\quad \cos\theta = \frac{x}{r}$ $\quad \tan\theta = \frac{y}{x}$

$= \frac{-1}{\sqrt{2}}$ $\quad = \frac{-1}{\sqrt{2}}$ $\quad = \frac{-1}{-1}$

$= 1$

$\angle RAA = 45°$

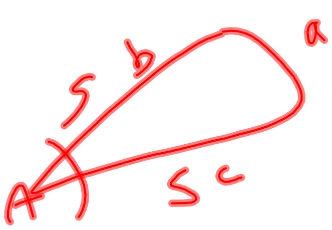
5.7 The Cosine Law

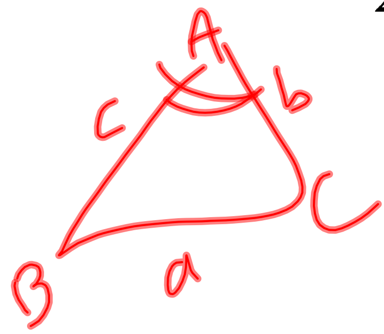
Date: Nov. 20/15

Recall: We use the Cosine Law when we are given:

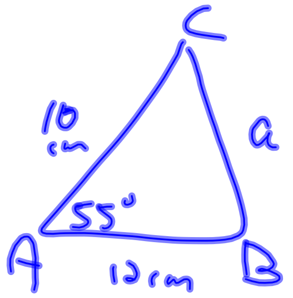
2 sides and the **contained** angle (SAS) or all 3 sides (SSS)

$$a^2 = b^2 + c^2 - 2bc\cos A \quad \text{or} \quad \cos A = \frac{b^2 + c^2 - a^2}{2bc}$$





Ex. 1 Given $\triangle ABC$, where $\angle A = 55°$, $b = 10$ cm and $c = 12$ cm.
Determine the length of a to the nearest tenth.



$a^2 = 10^2 + 12^2 - 2(10)(12)\cos 55°$

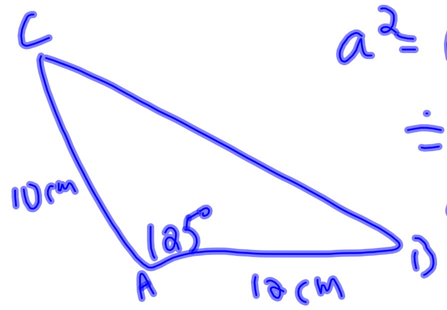
$\doteq 106.34$

$a \doteq \sqrt{106.34}$

$\doteq 10.31$

$\doteq 10.3$ cm

Ex. 2: Repeat given $\angle A = 125°$.



$a^2 = 10^2 + 12^2 - 2(10)(12)\cos 125°$

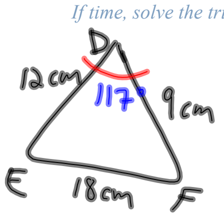
$\doteq 381.65$

$a \doteq \sqrt{381.65}$

$\doteq 19.53$

$\doteq 19.5$ cm

Ex. 3 Given $\triangle DEF$, where $d = 18$ cm, $e = 9$ cm and $f = 12$ cm.
Calculate the measure of $\angle D$, to the nearest degree.
If time, solve the triangle; if not, explain possible ambiguous case.



$\cos D = \dfrac{e^2 + f^2 - d^2}{2ef}$

$= \dfrac{9^2 + 12^2 - 18^2}{2(9)(12)}$

$D = \cos^{-1}\left(\dfrac{9^2 + 12^2 - 18^2}{2(9)(12)}\right)$

$\doteq \cos^{-1}(-0.458)$

$D \doteq 117°$

$\theta = 180 - \beta$
$\doteq 117.3$
$\doteq 117$

Note:

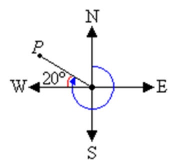
A **true bearing** to a point is the angle between due north and the line of travel of an object measured in degrees in a clockwise direction. We will refer to this as **bearing**.

A **conventional bearing** of a point is stated as the number of degrees east or west of the north-south line. We will refer to this as **direction**.

In the diagram below, the bearing of point P is 290°.

The direction method can be stated in two ways:

- W20°N (point P is 20° north of west)
- N70°W (point P is 70° west of north)



Ex. 3 Given $\triangle DEF$, where $d = 18$ cm, $e = 9$ cm and $f = 12$ cm.
Calculate the measure of $\angle D$, to the nearest degree.

$$d^2 = e^2 + f^2 - 2ef\cos D$$

$$18^2 = 9^2 + 12^2 - 2(9)(12)\cos D$$

$$\frac{18^2 - 9^2 - 12^2}{-2(9)(12)} = \frac{\cancel{-2(9)(12)}\cos D}{\cancel{-2(9)(12)}}$$

$$\frac{18^2 - 9^2 - 12^2}{-2(9)(12)} = \cos D$$

$$\frac{d^2 - e^2 - f^2}{-2ef} = \cos D$$

Are there any Homework Questions you would like to see on the board?

Last day's work: pp. 318-319 #1, 2, 3a, 4, 5ac, 7 [15,17]

Today's Homework Practice includes:

pp. 325-327 #1b, 2b, 3bc, 4ac, 5, 6, 8 [12,14]