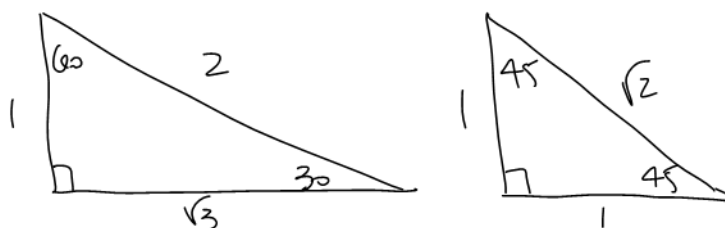


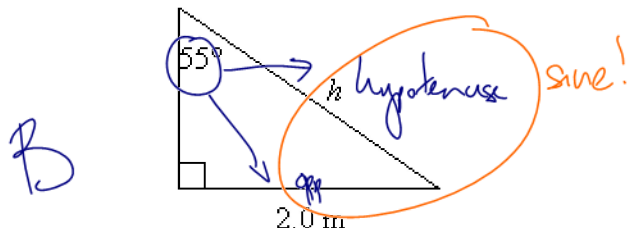
3U5: Trig Ratios - Practice Test



Multiple Choice

Identify the choice that best completes the statement or answers the question. Circle the letter representing your choice and write your letter in appropriate blank.

1. Determine the length of the hypotenuse of the triangle to the nearest tenth of a metre.



$\sin(55) = \frac{2}{h}$ "swap places"
 $\Rightarrow h = \frac{2}{\sin(55)} = 2.44$

- a. 3.1 m c. 2.1 m
 b. 2.4 m d. 2.9 m

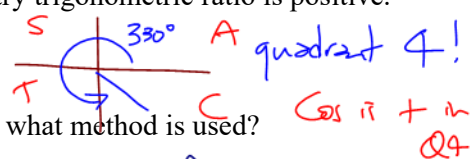
2. Determine the exact value of $\cos 45^\circ \times \frac{\tan 30^\circ}{\sin 60^\circ}$

- C
- a. $\frac{2\sqrt{2}}{3}$ c. $\frac{\sqrt{2}}{3}$
 b. $\frac{3\sqrt{2}}{2}$ d. $\frac{\sqrt{3}}{3}$

$(\frac{1}{\sqrt{2}}) \times (\frac{\frac{1}{\sqrt{3}}}{\frac{\sqrt{3}}{2}}) = \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{3}} \times \frac{2}{\sqrt{3}}$
 (flip and times)
 $= \frac{2}{\sqrt{18}} = \frac{2}{\sqrt{9 \times 2}} = \frac{2}{3\sqrt{2}} = \frac{2}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{3 \times 2} = \frac{\sqrt{2}}{3}$

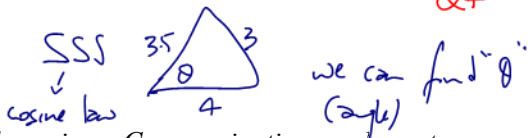
3. For the angle of rotation $\theta = 330^\circ$, in standard position, determine which primary trigonometric ratio is positive.

- B
- a. sine c. tangent
 b. cosine d. none are positive



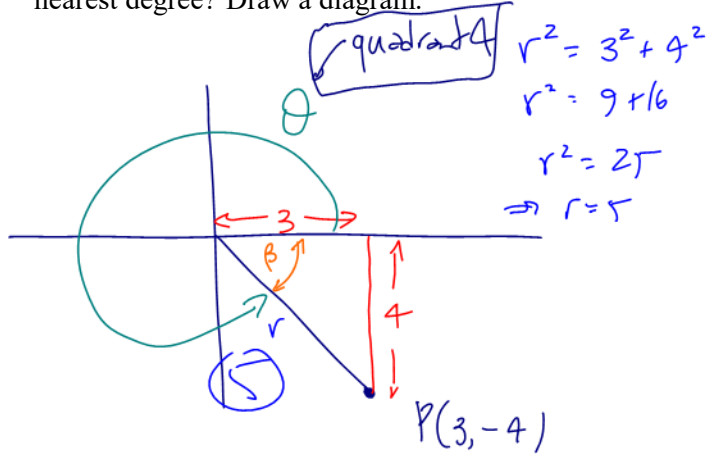
4. If 3 sides are known for a triangle, what piece of information can be found and what method is used?

- D
- a. side, sine law c. angle, sine law
 b. side, cosine law d. angle, cosine law



Written Solutions - Provide clear well written solutions. On the actual test you will receive a Communicatio grade, out of 3, for how well your mathematics is presented.

5. $P(3, -4)$ lies on the terminal arm of an angle in standard position. What is the value of the principal angle θ to the nearest degree? Draw a diagram.

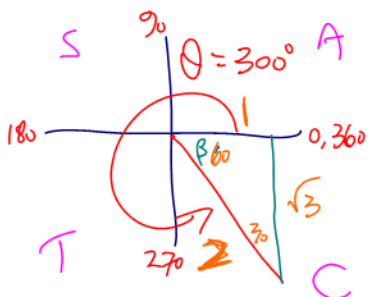


$\tan(\beta) = \frac{4}{3}$
 $\Rightarrow \beta = \tan^{-1}(\frac{4}{3}) = 53^\circ$

$\therefore \theta = 360 - \beta$
 $= 360 - 53 = 307^\circ$

6. For each question, draw the angle of rotation and determine the EXACT trig ratio:

a) $\cos(300^\circ)$



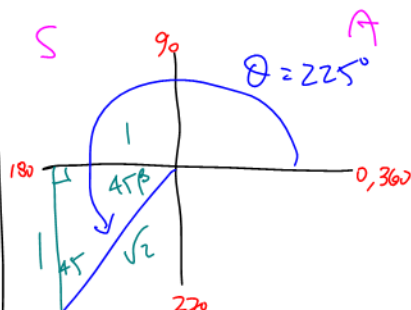
$\beta = 60$

$$\cos(300) = + \frac{1}{2}$$

cos is "+" in Q4

not necessary to rationalize the denominator

b) $\sin(225^\circ)$



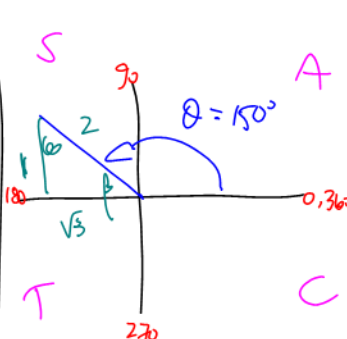
$$\beta = 225 - 180 = 45$$

Sine is "-" in Q3

$$\sin(225) = - \frac{1}{\sqrt{2}}$$

$$\left(= - \frac{\sqrt{2}}{2} \right)$$

c) $\tan(150^\circ)$



$$\beta = 180 - 150 = 30$$

$$\tan(150) = - \frac{1}{\sqrt{3}}$$

tan is "-" in Q2

tangent is positive in Q1, Q3

7. Given the trig ratio determine both possible values for θ where $0^\circ \leq \theta \leq 360^\circ$:

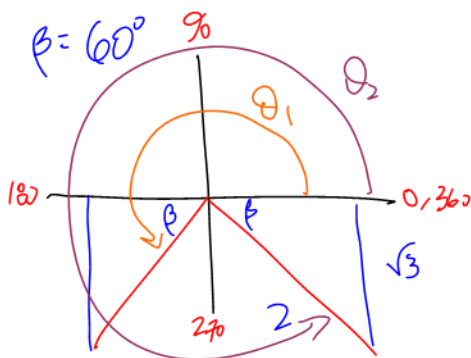
a) $\sin(\theta) = -\frac{\sqrt{3}}{2}$ (exact values please)

b) $\cos(\theta) = 0.642$

Q1, Q4 is where cosine is positive
calculator

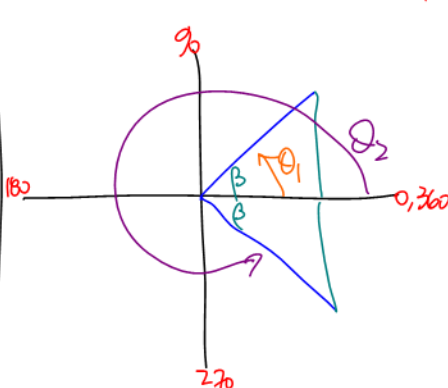
c) $\tan(\theta) = \frac{1}{1}$

think of "-1" $\Rightarrow \frac{1}{1} \Rightarrow \pm \text{rati.}$



$$\begin{aligned} \theta_1 &= 180 + \beta \\ &= 180 + 60 \\ &= 240 \end{aligned}$$

$$\begin{aligned} \theta_2 &= 360 - \beta \\ &= 360 - 60 \\ &= 300 \end{aligned}$$

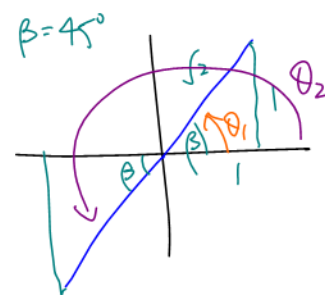


$$\cos(\beta) = 0.642$$

$$\begin{aligned} \Rightarrow \beta &= \cos^{-1}(0.642) \\ &= 50 \end{aligned}$$

$$\theta_1 = \beta = 50$$

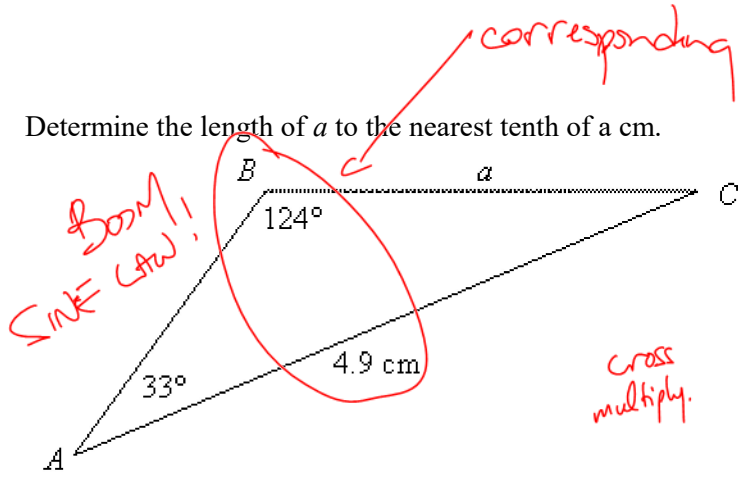
$$\begin{aligned} \theta_2 &= 360 - \beta \\ &= 360 - 50 = 310 \end{aligned}$$



$$\theta_1 = \beta = 45$$

$$\begin{aligned} \theta_2 &= 180 + \beta \\ &= 180 + 45 \\ &= 225 \end{aligned}$$

8. Determine the length of a to the nearest tenth of a cm.



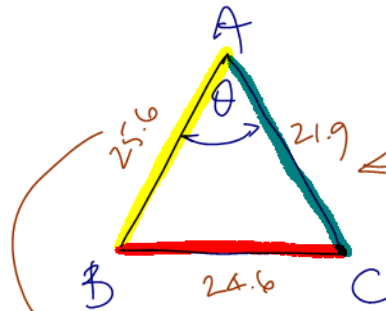
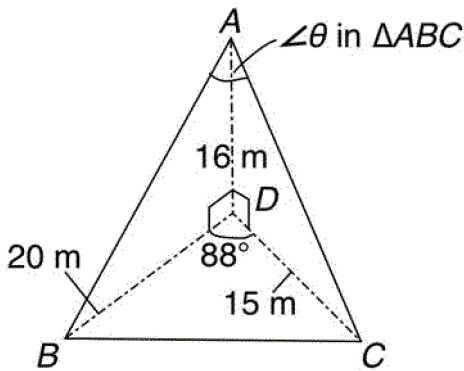
$$\frac{a}{\sin(33)} = \frac{4.9}{\sin(124)}$$

cross multiply.

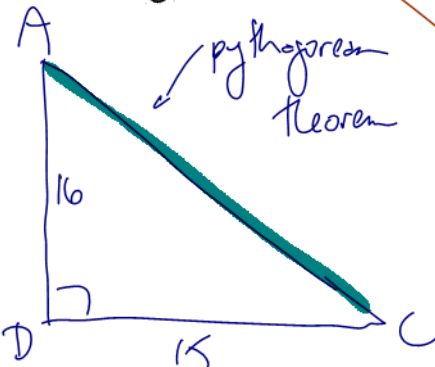
$$\Rightarrow a = \frac{(4.9)(\sin(33))}{\sin(124)}$$

$$= 3.2 \text{ cm.}$$

9. Determine angle, θ .



Pythagorean Theorem



Pythagorean Theorem

SIDE AB

$$AB^2 = 20^2 + 16^2$$

$$\Rightarrow AB = \sqrt{400 + 256}$$

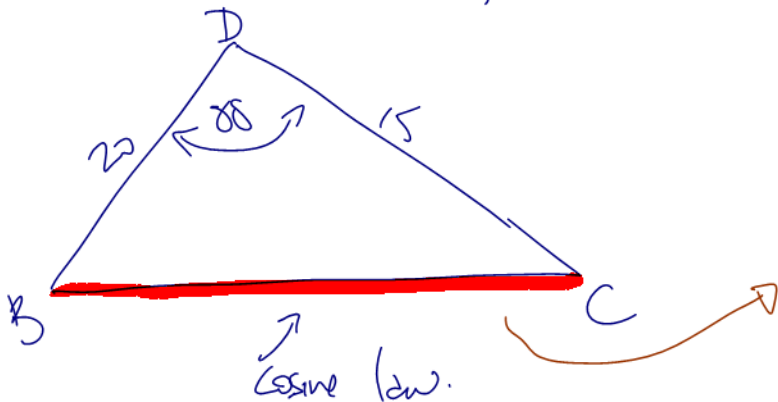
$$= 25.6$$

SIDE AC

$$AC^2 = 16^2 + 15^2$$

$$\Rightarrow AC = \sqrt{256 + 225}$$

$$= 21.9$$



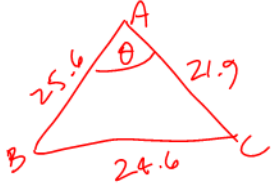
Cosine Law.

SIDE BC (Cosine Law)

$$BC^2 = 20^2 + 15^2 - 2(20)(15)\cos(88)$$

$$\Rightarrow BC = \sqrt{20^2 + 15^2 - 2(20)(15)(\cos(88))}$$

$$= 24.6 \text{ cm.}$$

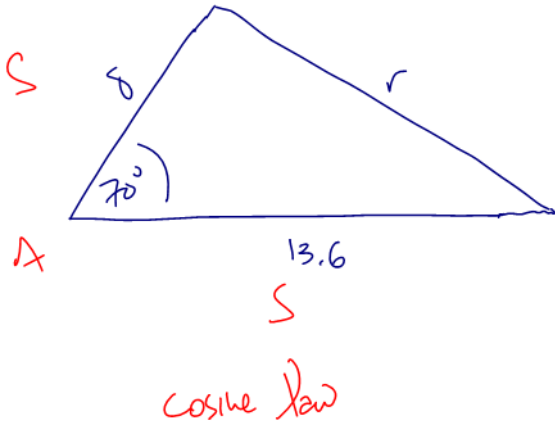


To find angle A
 \Rightarrow cosine law

$$\cos(A) = \frac{a^2 - b^2 - c^2}{-2bc} = \frac{24.6^2 - 25.6^2 - 21.9^2}{-2(25.6)(21.9)} = 0.473$$

$$\therefore \cos(A) = 0.473 \Rightarrow A = \cos^{-1}(0.473) \doteq 62^\circ$$

10. Jim is looking at the roof of a new house from the front. He notices that the roof is triangular in shape with a base 13.6 m. The left side is 8.0 m long and makes an angle of 70° with the base of the roof. Determine the length of the right side of the roof. Be sure to first make a sketch.



$$r^2 = 8^2 + 13.6^2 - 2(8)(13.6)\cos(70)$$

$$\Rightarrow r = \sqrt{8^2 + 13.6^2 - 2(8)(13.6)\cos(70)}$$

$$\doteq 13.2 \text{ m.}$$