Name Solutions

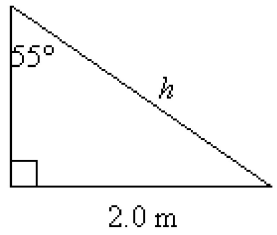
A∞Ω
MATH@TD

MCR3U

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.



$\sin(55) = \frac{2}{h} \Rightarrow h = \frac{2}{\sin(55)}$
$\doteq 2.44$

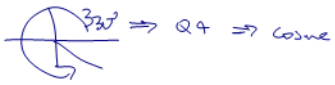
a. 3.1 m
b. 2.4 m
c. 2.1 m
d. 2.9 m

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

$= \left(\frac{1}{\sqrt{2}}\right) \times \left(\frac{\frac{1}{\sqrt{3}}}{\frac{\sqrt{3}}{2}}\right) = \left(\frac{1}{\sqrt{2}}\right)\left(\frac{1}{\sqrt{3}} \cdot \frac{2}{\sqrt{3}}\right) = \frac{2}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$
$= \frac{\sqrt{2}}{3}$

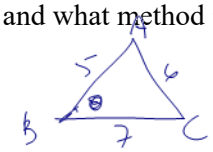
a. $\frac{2\sqrt{2}}{3}$
b. $\frac{3\sqrt{2}}{2}$
c. $\frac{\sqrt{2}}{3}$
d. $\frac{\sqrt{3}}{3}$

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



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

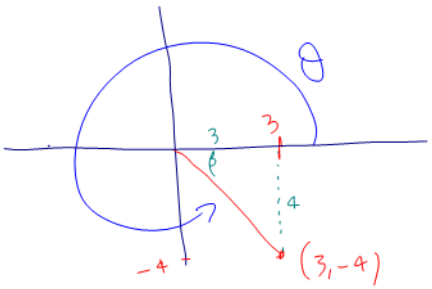
4. If 3 sides are known for a triangle, what piece of information can be found and what method is used?



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

Written Solutions - *Provide clear well written solutions. On the actual test you will receive a Communicatios 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.



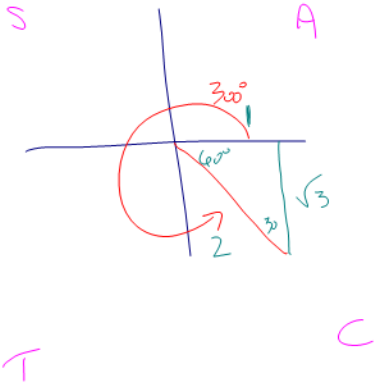
$\tan(\beta) = \frac{4}{3}$
$\Rightarrow \beta = \tan^{-1}\left(\frac{4}{3}\right)$
$\doteq 53°$

$\therefore \theta = 360 - 53°$
$= 307°$

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

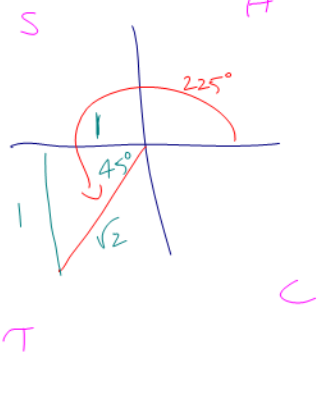
a) cos(300°)

$= +\frac{1}{2}$



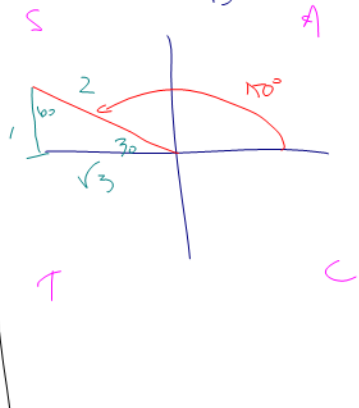
b) sin(225°)

$= -\frac{1}{\sqrt{2}} \left(= -\frac{\sqrt{2}}{2}\right)$



c) tan(150°)

$= -\frac{1}{\sqrt{3}} \left(= -\frac{\sqrt{3}}{3}\right)$

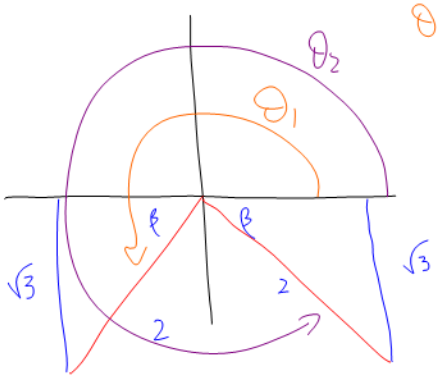


7. Given the trig ratio determine **both possible** values for θ where $0° \le \theta \le 360°$:

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

Q3, Q4

$\beta = 60°$



$\theta_1 = 180 + \beta$

$= 180 + 60$

$= 240°$

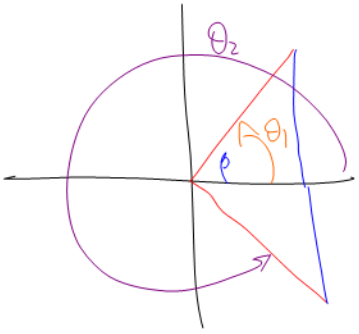
$\theta_2 = 360 - 60$

$= 300°$

b) $\cos(\theta) = 0.642$ $\Rightarrow$ $\beta = \cos^{-1}(0.642)$

$\div 50°$

Q1, Q4



$\theta_1 = \beta = 50°$

$\theta_2 = 360 - \beta$

$= 360 - 50$

$= 310°$

8. Prove the identity $\dfrac{\sin(\theta)\times\tan(\theta)}{\sec(\theta)} = 1-\cos^2(\theta)$

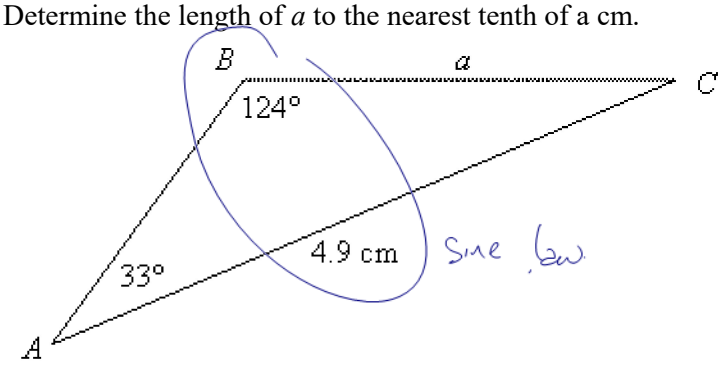
$$LS = \frac{\sin(\theta)\cdot\tan(\theta)}{\sec(\theta)}$$

$$= \frac{\sin(\theta)\cdot\dfrac{\sin(\theta)}{\cos(\theta)}}{\dfrac{1}{\cos(\theta)}}$$

$$= \frac{\sin^2(\theta)}{\cos(\theta)}\cdot\frac{\cos(\theta)}{1} = \sin^2\theta$$

$$= 1-\cos^2\theta = RS \quad \square$$

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

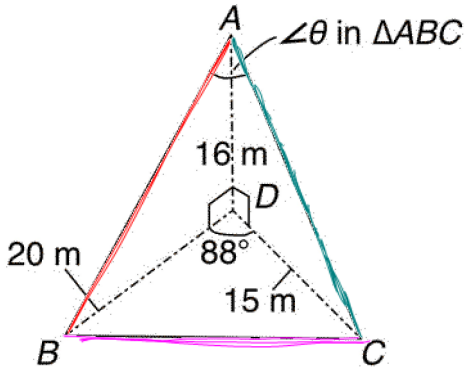


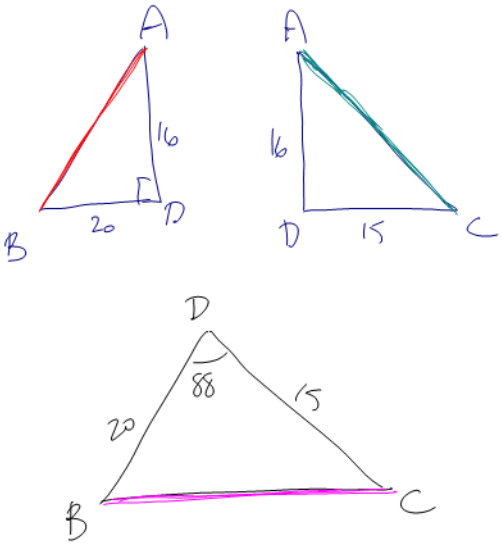
Sine law

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

$$\Rightarrow a = \frac{(4.9)\sin(33)}{\sin(124)} = 3.2 \text{ cm.}$$

10. Determine angle, θ.

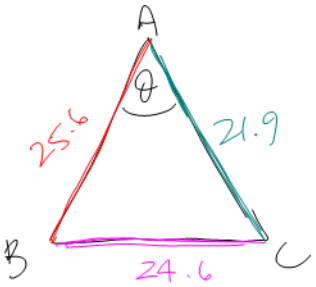




$AB = \sqrt{20^2 + 16^2}$ $\doteq 25.6$

$AC = \sqrt{16^2 + 15^2}$ $\doteq 21.9$

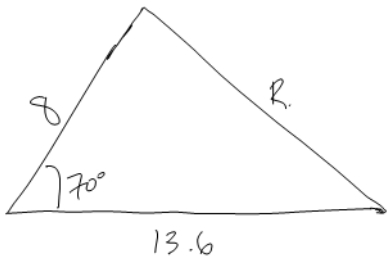
$BC = \sqrt{20^2 + 15^2 - 2(20)(15)\cos(88)}$ $\doteq 24.6$



$\cos(\theta) = \dfrac{24.6^2 - 25.6^2 - 21.9^2}{-2(25.6)(21.9)}$ $\doteq 62°$

$\Rightarrow \theta = \cos^{-1}(\quad)$

11. 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.



Cosine Law

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

$\Rightarrow R = \sqrt{\quad}$

$\doteq 13.2$ m.