ch5

3U Trigonometry Test 1 Part 1

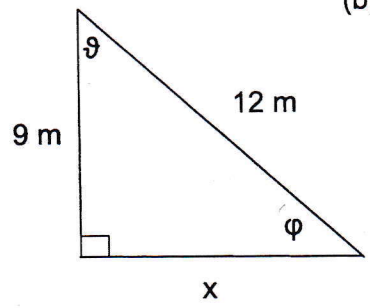
16.5/44

Name: SaySay

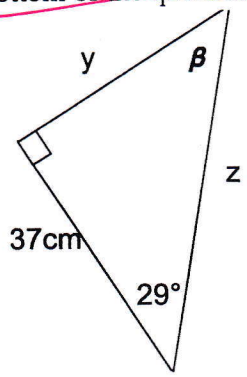
1. Solve for all of the unknowns in the following right triangle.
(Show all work and state answers at the bottom of the question to 1 decimal place.)

[6] 2.5

(a)



(b)



$\cos(\theta) = \frac{9}{12}$

$90 - 29 = 61$

$\beta = 61$

$\frac{\sin(61)}{37} = \frac{\sin(29)}{y}$

$y = \frac{\sin(29)\ 37}{\sin(61)}$

$y = \frac{17.98}{0.87}$

$y = 20.62$

$\frac{\sin(61)}{37} = \frac{\sin(90)}{z}$

$z = \frac{37 \sin(90)}{\sin(61)}$

$z = \frac{37}{0.87}$

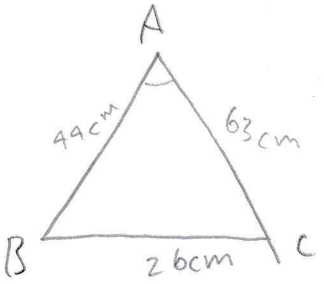
$z = 42.53$

(a) x = 7 b, ϑ = 36.4 b, φ = 53.6 b

(b) y = 20.6 cm, z = 42.5 cm, β = 61° ✓

2. In ΔABC sides a = 26 cm, b = 63 cm, and c = 44 cm. Determine all angles to 1 decimal place.

[5]



$A = \cos^{-1} \frac{63^2 + 44^2 - 26^2}{2(63)(44)}$

$A = \cos^{-1} \frac{3969 + 1936 - 676}{5544}$

$A = \cos^{-1} \frac{5229}{5544}$

$A = \cos^{-1} 0.94$

$A = \cos^{-1} 19.41$

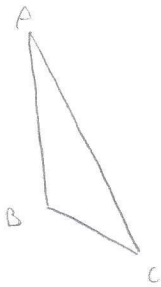
$B = \cos^{-1} \frac{26^2 + 44^2 - 63^2}{2(26)(44)}$

$= \cos^{-1} \frac{676 + 1936 - 3969}{2288}$

$= \cos^{-1} \frac{-1357}{2288}$

$= \cos^{-1} -0.59$

$= 126.3$



$\angle A = 19.4°$ ✓

$\angle B = 126.4$

$\angle C = 34.2°$

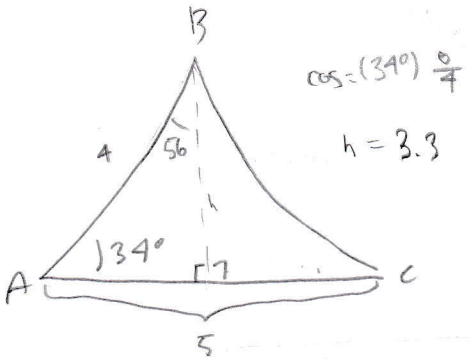
$(126.4 + 19.4) - 180 = 34.2$

7.5

7.5

3. Determine all lengths and angles in ΔABC where angle B is obtuse and $\angle A = 34°$, b = 5 cm, a = 4 cm. (answer to 1 decimal place.)

[5]

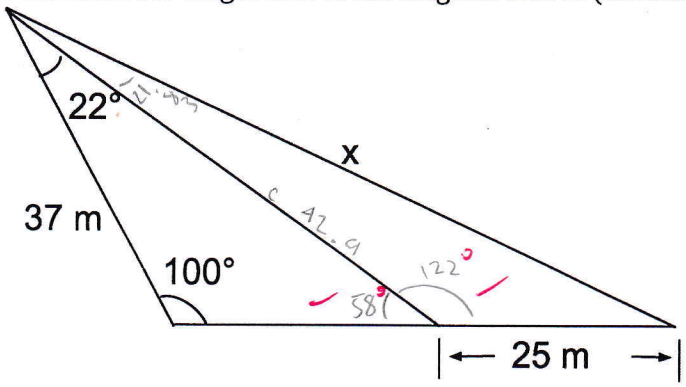


$\cos(34°) = \frac{h}{4}$

$h = 3.3$

$\angle C = 36$

4. Determine the length of x in the diagram below. (answer to one decimal place.)



$\frac{\sin(21.88)}{25} = \frac{\sin(122)}{x}$

$x = \frac{(\sin 122)\ 25}{\sin 21.88}$

$x = \frac{21.2}{0.37}$

$x = 57.3$

[5]

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$\frac{\sin(100)}{c} = \frac{\sin(58)}{37}$

$c = \frac{\sin(100)\ 37}{\sin(58)}$ all in one in calculator

$c = \frac{36.44}{0.85}$

$c = 42.89$

(cos)?

$= \sqrt{25^2 + 42.9^2 - 2(25)(42.9)\cos(122)}$

$= \sqrt{625 + 1840.41 - 2145\cos(122)}$

$= \sqrt{2465.41 - 1988.81}$

$= \sqrt{476.6}$

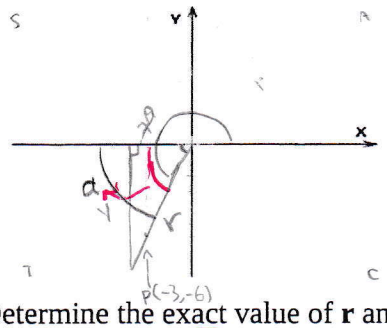
$= 21.83$

3

1.0-5

5. (a) For a terminal arm created by the point P(-3, -6), sketch a diagram of this, labeling the **principal angle ϑ** and the **related acute angle α.**

[2]



(b) Determine the exact value of **r** and then state the exact values of the three primary trig ratios of the angle **ϑ**. (reduce radicals and fractions)

r = Hypotneuse

x = opposite

y = adjacent

Sin (ϑ) = $\frac{y}{r}$

Cos (ϑ) = $\frac{x}{r}$

Tan (ϑ) = $\frac{y}{x}$

[4]

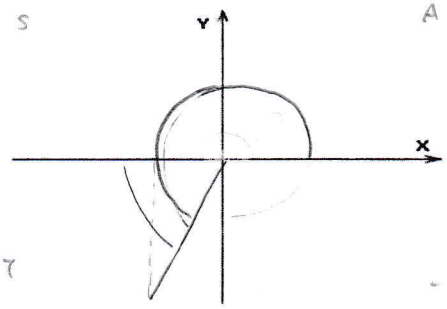
(c) Determine **α** and **ϑ** to 1 decimal place.

[2]

$\alpha = \frac{x}{r}$ $\theta =$

2. Determine the **exact** value of **sec (210°)** by drawing a diagram of the terminal arm on the cartesian plane, and appropriate special triangle with side lengths and Angles.

sec (210°) = $\frac{x}{r}$



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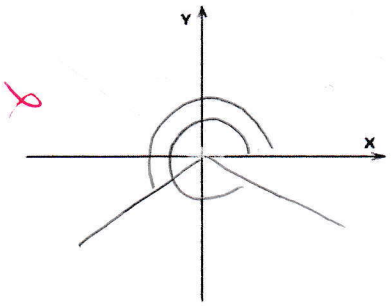
[3]

3. For **cos (A)** = **-⅔,** where 0° ≤ **A** ≤ 360°, (i) sketch the possible positions of the terminal arms for angle A on the cartesian plane, (ii) determine the exact values of **tan (A)**, and (iii) determine all values for **A** to 1 decimal place.

[4]



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3

13.5

3U Trigonometry Test 1 Part 2

Name: SaySay

$$\sin^2\theta + \cos^2\theta = 1$$

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

Prove

(a) $\dfrac{1-\sin x}{\cos x} = \dfrac{\cos x}{1+\sin x}$ (b) $\tan x + \dfrac{\cos x}{1+\sin x} = \dfrac{1}{\cos x}$

[4],[4]

(1) (2)

L.S. $= \dfrac{1-\sin x}{\cos x}$

$= \dfrac{1-\sin x}{\cos x} \cdot \dfrac{1+\sin x}{1+\sin x}$ ✓

$= \dfrac{1-\sin^2 x}{\cos x(1+\sin x)}$?

$= \dfrac{1-\sin^2 x \cos x}{\cos x}$ ✗

$= \dfrac{\cos x}{1+\sin x}$

L.S. $= \tan x + \dfrac{\cos x}{1+\sin x}$

$= \dfrac{\sin x}{\cos x} + \dfrac{\cos x}{1+\sin x}$

$= \dfrac{\sin x(1+\sin x)}{\cos x(1+\sin x)} + \dfrac{\cos x \cos x}{\cos x(1+\sin x)}$

$= \dfrac{\sin x(1+\sin x)}{\cos x(1+\sin x)} + \dfrac{\cos^2 x}{\cos x(1+\sin x)}$

C.F. ✓ $= \dfrac{(1+\sin x)(\sin^2 x + \cos^2 x)}{\cos x(1+\sin x)}$

$= \dfrac{1}{\cos x}$

$= R.S$

$\therefore L.S = R.S.$

3