

1. Find the exact values of $\sin(2u)$, $\cos(2u)$, and $\tan(2u)$ using the double-angle formulas.

Given $\sin(u) = -\frac{3}{5}$ and $\frac{3\pi}{2} < u < 2\pi$. [Hint: Draw a triangle] (5pt)



$$a = \sqrt{25 - 9} = 4$$

$$\sin(2u) = 2 \sin(u) \cos(u)$$

$$= 2 \left(-\frac{3}{5} \right) \left(\frac{4}{5} \right) = -\frac{24}{25}$$

$$\sin(2u) = \underline{-\frac{24}{25}}$$

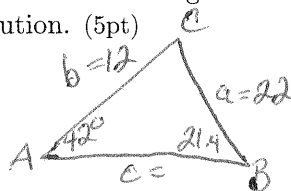
$$\cos(2u) = 1 - 2 \sin^2(u) = 1 - 2 \left(-\frac{3}{5} \right)^2 = 1 - 2 \left(\frac{9}{25} \right) = 1 - \frac{18}{25} = \frac{7}{25}$$

$$\cos(2u) = \underline{\frac{7}{25}}$$

$$\tan(2u) = \frac{\sin(2u)}{\cos(2u)} = \frac{-\frac{24}{25}}{\frac{7}{25}} = -\frac{24}{7}$$

$$\tan(2u) = \underline{-\frac{24}{7}}$$

2. Solve the triangle with the given information: $A = 42^\circ$, $a = 22$, & $b = 12$. Explain why there can be only one solution. (5pt)



$$\sin B = 12 \left(\frac{\sin 42}{22} \right) = 0.364980 \dots$$

$$B = 21.4$$

$$C = 180 - 42 - 21.4 = 116.6$$

$$c = \sin(116.6) \left(\frac{22}{\sin 42} \right) = 29.4$$

or $B = 158.6$ which is too

large to be in our triangle
since $42 + 158.6 > 180$

$$B = \underline{21.4} \quad C = \underline{116.6} \quad c = \underline{29.4}$$