

Section 5-3 Continued

Use the composite argument properties to show that the given equation is an identity.

1.  $\cos 10x \cos 6x + \sin 10x \sin 6x = \cos 4x$

\* use:  $\cos A \cos B + \sin A \sin B = \cos (A-B)$

'A' = 10x 'B' = 6x

$\rightarrow \cos (10x - 6x) =$

$\cos 4x = \cos 4x$

- a) Find the general solution for  $\theta$  and then b) the particular solutions for  $\theta \in [0, 360^\circ)$

2.  $\sin \theta \cos 35^\circ + \cos \theta \sin 35^\circ = 0.5$

a.)  $\sin (\theta + 35^\circ) = 0.5$

$\theta + 35^\circ = \arcsin 0.5$

$\theta + 35^\circ = \sin^{-1}(0.5) + 360^\circ n$

AND  $\theta + 35^\circ = 180 - \sin^{-1}(0.5) + 360^\circ n$

$\theta = -35^\circ + \sin^{-1}(0.5) + 360^\circ n$

$\theta = -35 + [180 - \sin^{-1}(0.5)] + 360^\circ n$

b.)  $\theta = -35^\circ + 30^\circ + 360^\circ n$

AND  $\theta = -35^\circ + 150^\circ + 360^\circ n$

$\theta = -5^\circ + 360^\circ n$

AND  $\theta = 115^\circ + 360^\circ n$

$\theta = -5^\circ, 355^\circ, 715^\circ$

$\theta = 115^\circ, 475^\circ$

$\theta = 115^\circ, 355^\circ$

3.  $\frac{\tan \theta + \tan 27^\circ}{1 - \tan \theta \tan 27^\circ} = 1$

a.)  $\tan (\theta + 27^\circ) = 1$

$\theta + 27^\circ = \arctan 1$

$\theta + 27^\circ = \tan^{-1}(1) + 180^\circ n$

$\theta = -27^\circ + \tan^{-1}(1) + 180^\circ n$

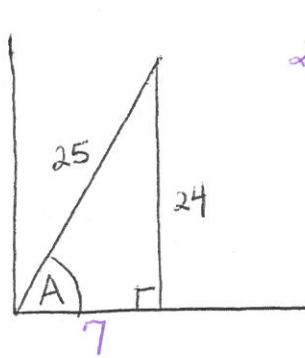
b.)  $\theta = -27^\circ + 45^\circ + 180^\circ n$

$\theta = 18^\circ + 180^\circ n$

$\theta = 18^\circ, 198^\circ, 378^\circ$

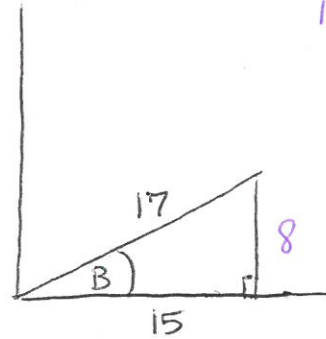
$\theta = 18^\circ, 198^\circ$

The figures show angles A and B. Use the composite argument properties to find the exact value (no decimals).



$$25^2 - 24^2 = a^2$$

$$7 = a$$



$$17^2 - 15^2 = b^2$$

$$8 = b$$

4.  $\sin(A + B)$

$$\frac{\sin A \cos B + \cos A \sin B}{\left(\frac{24}{25}\right) \left(\frac{15}{17}\right) + \left(\frac{7}{25}\right) \left(\frac{8}{17}\right)}$$

$$\frac{360}{425} + \frac{56}{425}$$

$$\boxed{\frac{416}{425}}$$

\*\* Don't have to know the angle -- just need to know the trig ratios of the angle.

5.  $\tan(A + B)$

$$\frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\frac{\left(\frac{24}{7}\right) + \left(\frac{8}{15}\right)}{1 - \left(\frac{24}{7}\right) \left(\frac{8}{15}\right)}$$

$$\frac{\left(\frac{416}{105}\right)}{\left(\frac{-29}{35}\right)}$$

$$\boxed{-\frac{416}{87}}$$