

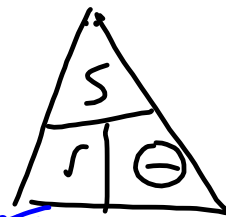
# Review

7.  $r = ? \text{ in}$  ;  $s = 3 \text{ mi}$  ;  $\theta = 2670 \text{ rev}$

$$s = r\theta$$

$$r = \frac{3 \text{ mi}}{2670 \text{ rev}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{1 \text{ rev}}{2\pi}$$

$$= \boxed{\frac{36}{\pi} \text{ in}}$$

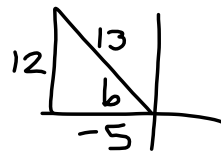
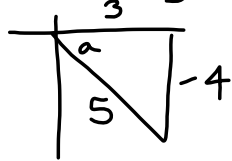


10.  $r = 3 \text{ ft}$  ;  $\theta = ?^\circ$  ;  $s = 4 \text{ in}$

$$\frac{s}{r} = \frac{r\theta}{r}$$

$$\theta = \frac{4 \text{ in}}{3 \text{ ft}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{20^\circ}{\pi} = \boxed{\frac{20^\circ}{\pi}}$$

$$12. \quad \cos a = \frac{3}{5} \quad \tan b = \frac{-12}{5}$$



$$\begin{aligned} \sin(a+b) &= \sin a \cos b + \cos a \sin b \\ &= \left(\frac{-4}{5}\right)\left(\frac{-5}{13}\right) + \left(\frac{3}{5}\right)\left(\frac{12}{13}\right) = \frac{20}{65} + \frac{36}{65} \\ &= \boxed{\frac{56}{65}} \end{aligned}$$

$$\begin{aligned} \cos(a+b) &= \cos a \cos b - \sin a \sin b \\ &= \left(\frac{3}{5}\right)\left(\frac{-5}{13}\right) - \left(\frac{-4}{5}\right)\left(\frac{12}{13}\right) = \\ &= \frac{-15}{65} + \frac{48}{65} = \boxed{\frac{33}{65}} \end{aligned}$$

$$\tan(a+b) = \frac{\sin(a+b)}{\cos(a+b)} = \frac{56/65}{33/65} = \boxed{\frac{56}{33}}$$

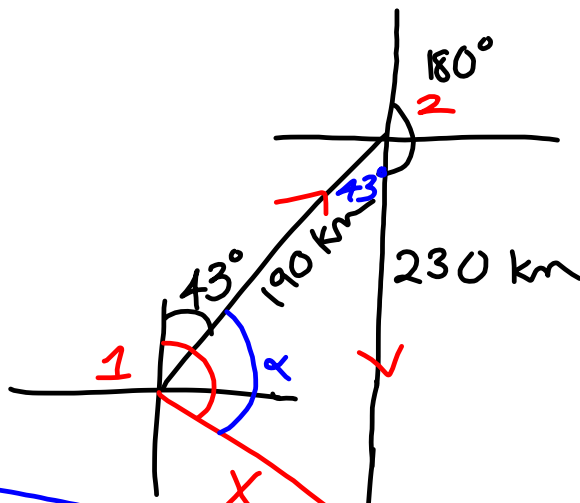
53. Prove.

$$\underbrace{\cos^2 x - 2\sin^2 x \cos^2 x} - \underbrace{\sin^2 x + 2\sin^4 x} = \cos^2 2x$$

$$\begin{aligned} \text{LHS} &= \cos^2 x (1 - 2\sin^2 x) - \sin^2 x (1 + 2\sin^2 x) = \\ &= (1 - 2\sin^2 x)(\cos^2 x - \sin^2 x) = \\ &= \cos 2x \cdot \cos 2x = \\ &= \cos^2 2x = \text{RHS} \end{aligned}$$

15.

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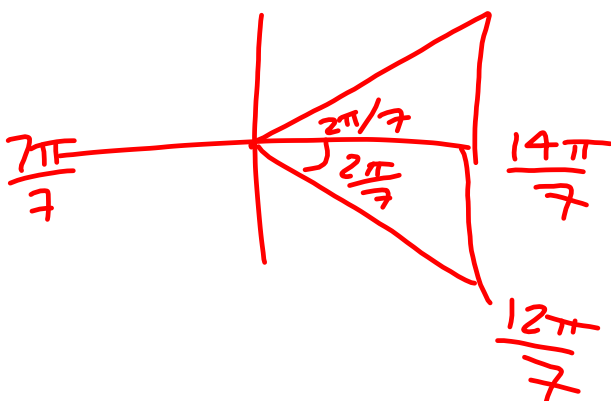
$$x = \sqrt{190^2 + 230^2 - 2(190)(230)\cos 43^\circ}$$

$$\frac{\sin \alpha}{230} = \frac{\sin 43^\circ}{x}$$

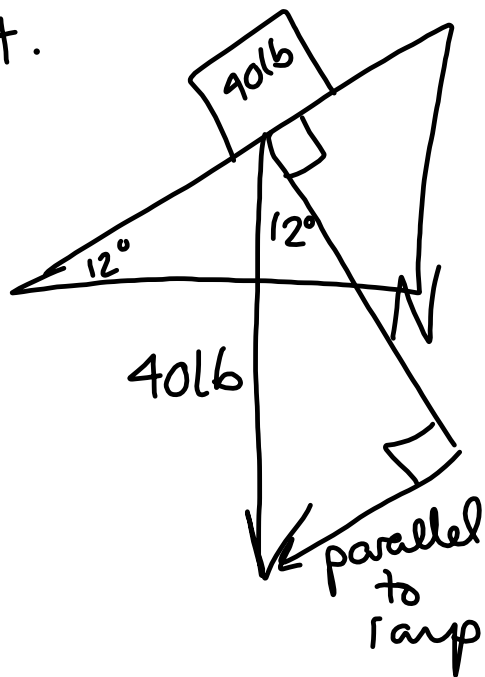
$$\alpha = \sin^{-1}\left(\frac{230 \sin 43^\circ}{x}\right)$$

$$\theta = 43^\circ + \alpha$$

$$34. \cos^{-1}\left(\cos\left(\frac{12\pi}{7}\right)\right) = \boxed{\frac{2\pi}{7}}$$



14.



$$\cos 12^\circ = \frac{N}{40}$$

$$N = 40 \cos 12^\circ \text{ lb}$$

57. solve for  $x \in [0, 2\pi)$ 

$$2 \cos^3 x = \cos x$$

$$2 \cos^3 x - \cos x = 0$$

$$\cos x (2 \cos^2 x - 1) = 0$$

$$\cos x = 0$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}$$

$$2 \cos^2 x - 1 = 0$$

$$2 \cos^2 x = 1$$

$$\cos^2 x = \frac{1}{2}$$

$$\cos x = \pm \frac{1}{\sqrt{2}}$$

$$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$