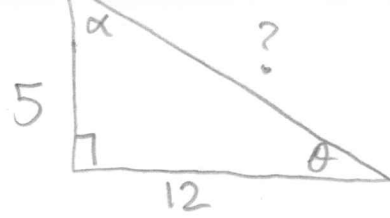


HW 9



$$\begin{aligned} \Rightarrow 5^2 + 12^2 &= ?^2 \\ \Rightarrow 25 + 144 &= ?^2 \\ \Rightarrow ? &= \sqrt{169} = 13 \end{aligned}$$

§9.3 #24

$$\begin{aligned} \sin(2\theta) &= 2\sin(\theta)\cos(\theta) \\ &= 2\left(\frac{5}{\sqrt{13}}\right)\left(\frac{12}{\sqrt{13}}\right) \end{aligned}$$

$$\begin{aligned} \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\ &= \left(\frac{12}{\sqrt{13}}\right)^2 - \left(\frac{5}{\sqrt{13}}\right)^2 \end{aligned}$$

$$\tan(2\theta) = \frac{\sin(2\theta)}{\cos(2\theta)} = \frac{2\left(\frac{5}{\sqrt{13}}\right)\left(\frac{12}{\sqrt{13}}\right)}{\left(\frac{12}{\sqrt{13}}\right)^2 - \left(\frac{5}{\sqrt{13}}\right)^2}$$

#28 Using identity for $\cos(2\theta)$,

$\frac{2\theta}{56}$

$$\begin{aligned} \cos^2(28^\circ) - \sin^2(28^\circ) &= \cos(2(28)^\circ) \\ &= \cos(56^\circ) \end{aligned}$$

#33 Using identity for $\sin(2\theta)$,

$$\begin{aligned} 6\sin(5x)\cos(5x) &= 3(2\sin(5x)\cos(5x)) \\ &= 3\sin(2(5x)) \\ &= 3\sin(10x) \end{aligned}$$

#34 | Start w/ left:

$$\begin{aligned}(\sin(t) - \cos(t))^2 &= \sin^2(t) - 2\sin(t)\cos(t) + \cos^2(t) \\ &= (\sin^2(t) + \cos^2(t)) - 2\sin(t)\cos(t) \\ &= 1 - \sin(2t)\end{aligned}$$

#40 | $\sin^4(8x) = \sin^2(8x)\sin^2(8x)$

reduction formula $\rightarrow = \left(\frac{1 - \cos(16x)}{2}\right)\left(\frac{1 - \cos(16x)}{2}\right)$

$$= \frac{1 - 2\cos(16x) + \cos^2(16x)}{4}$$

reduction formula

$$= \frac{1 - 2\cos(16x) + \frac{1 + \cos(32x)}{2}}{4}$$

#55 | Start w/ right:

$$\begin{aligned}\frac{2\tan(x)}{1 + \tan^2(x)} &= \frac{2\frac{\sin(x)}{\cos(x)}}{1 + \frac{\sin^2(x)}{\cos^2(x)}} \\ &= \frac{2\frac{\sin(x)}{\cos(x)}}{\frac{\cos^2(x) + \sin^2(x)}{\cos^2(x)}} \\ &= \frac{2\frac{\sin(x)}{\cos(x)} \cdot \cos^2(x)}{1} \\ &= 2\sin(x)\cos(x) \\ &= \sin(2x)\end{aligned}$$