

Dg. 268

#11, 15-18, 21-25 all

$$1. \sin \theta = \frac{24}{26} = \frac{12}{13} \quad \csc \theta = \frac{13}{12}$$

$$\cos \theta = \frac{10}{26} = \frac{5}{13} \quad \sec \theta = \frac{13}{5}$$

$$\tan \theta = \frac{24}{10} = \frac{12}{5} \quad \cot \theta = \frac{5}{12}$$

$$2. \begin{array}{l} \text{Diagram: Right triangle with vertical leg 6, horizontal leg 7, and hypotenuse } c. \text{ Angle } \theta \text{ is at the bottom right.} \\ 6^2 + 7^2 = c^2 \\ c = \sqrt{85} \end{array}$$

$$\sin \theta = \frac{6}{\sqrt{85}} = \frac{6\sqrt{85}}{85} \quad \csc \theta = \frac{\sqrt{85}}{6}$$

$$\cos \theta = \frac{7}{\sqrt{85}} = \frac{7\sqrt{85}}{85} \quad \sec \theta = \frac{\sqrt{85}}{7}$$

$$\tan \theta = \frac{6}{7} \quad \cot \theta = \frac{7}{6}$$

$$3. \tan 70^\circ = \frac{12}{x}$$

$$x = \frac{12}{\tan 70^\circ} = 4.4$$

$$4. \cos 25^\circ = \frac{20}{x}$$

$$x = \frac{20}{\cos 25^\circ} = 22.1$$

$$5. \begin{array}{l} \text{Diagram: Right triangle with vertical leg } x, \text{ horizontal leg } 7.9, \text{ and angle } 80^\circ \text{ at the bottom right.} \\ \tan 80^\circ = \frac{x}{7.9} \\ 7.9 \tan 80^\circ = x \\ 44.8 \text{ ft} = x \end{array}$$

$$b. \begin{array}{l} \text{Diagram: Right triangle with vertical leg 6, horizontal leg } a, \text{ and angle } \theta \text{ at the bottom right.} \\ \tan \theta = \frac{6}{6.7} \\ \theta = \tan^{-1}\left(\frac{6}{6.7}\right) \\ \theta = 41.8^\circ \end{array}$$

$$6. \tan \theta = \frac{10}{5}$$

$$\theta = \tan^{-1}\left(\frac{10}{5}\right)$$

$$\theta = 63.4^\circ$$

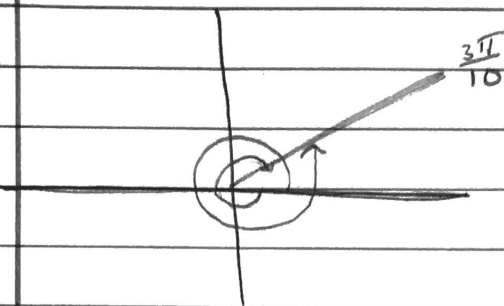
$$7. \cos \theta = \frac{11}{15}$$

$$\theta = \cos^{-1}\left(\frac{11}{15}\right)$$

$$\theta = 42.8^\circ$$

$$8. \frac{2\pi}{\pi} \cdot \frac{180}{\pi} = 40^\circ$$

9.



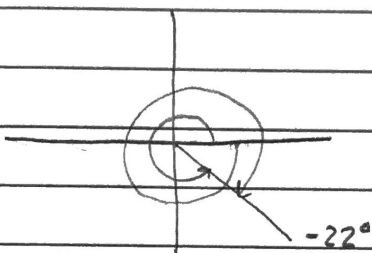
$$\frac{3\pi}{10} + 2\pi$$

$$\frac{3\pi}{10} + \frac{20\pi}{10} = \frac{23\pi}{10}$$

$$\frac{3\pi}{10} - 2\pi$$

$$\frac{3\pi}{10} - \frac{20\pi}{10} = \frac{-17\pi}{10}$$

10.



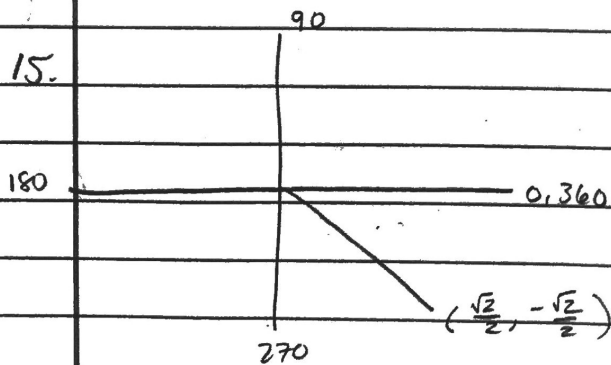
$$360 - 22 = 338^\circ$$

$$-360 - 22 = -382^\circ$$

11.

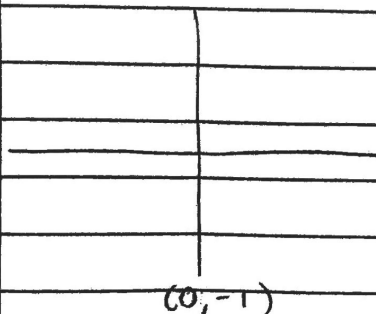
$$\frac{2000}{360} \cdot \pi (7)^2 = 111.177 \text{ in}^2 \quad \text{D'}$$

15.



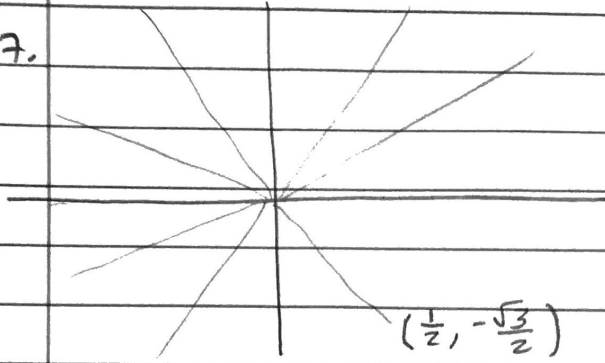
$$\cos(315^\circ) = \frac{\sqrt{2}}{2}$$

16.



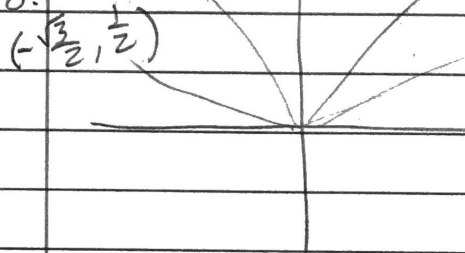
$$\sec\left(\frac{3\pi}{2}\right) = \frac{1}{\cos\left(\frac{3\pi}{2}\right)} = \frac{1}{0} = \text{undefined}$$

17.



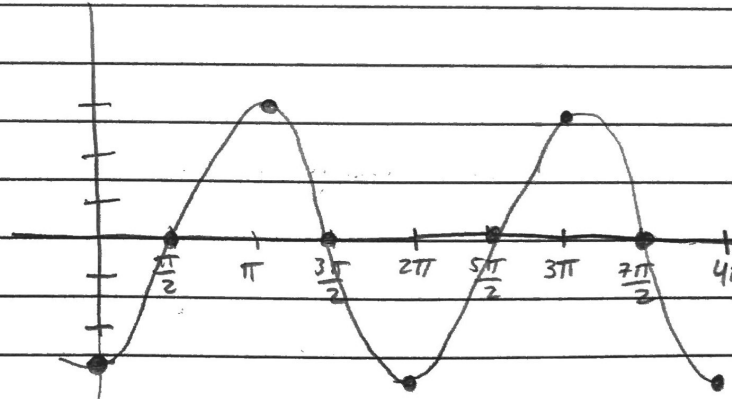
$$\sin\left(\frac{5\pi}{3}\right) = -\frac{\sqrt{3}}{2}$$

18.

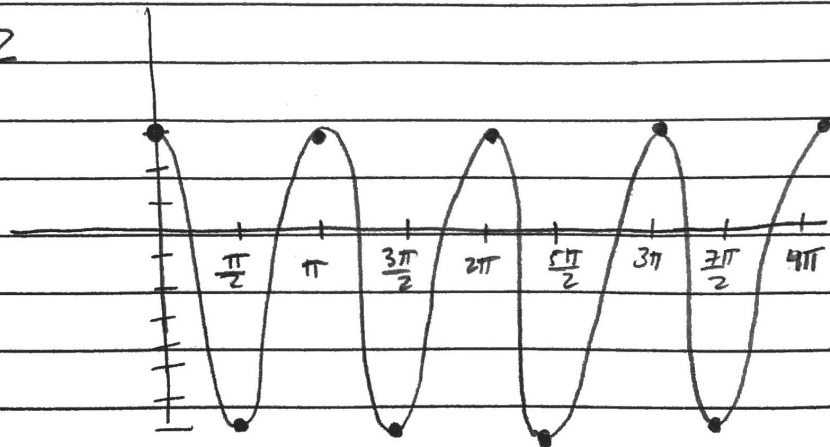


$$\tan\left(\frac{5\pi}{6}\right) = \frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$$

21.  $y = -3\sin\left(x - \frac{3\pi}{2}\right)$   
 $A = -3$   $B = 1$   $C = -\frac{3\pi}{2}$   $D = 0$   
 amp = 3  
 period =  $\frac{2\pi}{1} = 2\pi$   
 frequency =  $\frac{1}{2\pi}$   
 phase shift =  $-\frac{-3\pi/2}{1} = \frac{3\pi}{2}$   
 vertical shift = 0

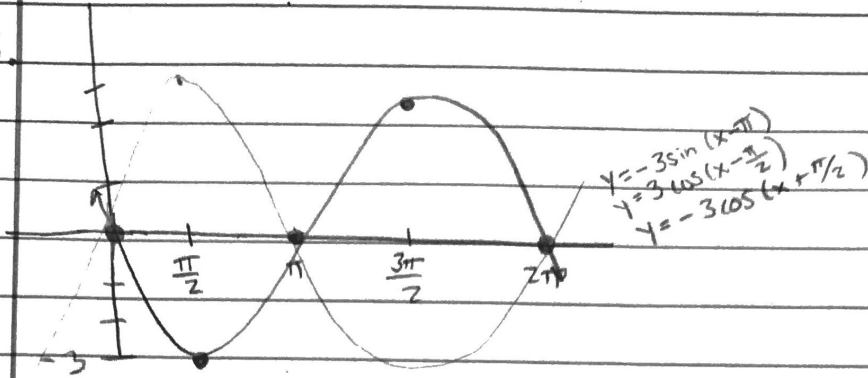


22.  $y = 5\cos(2x) - 2$   
 $A = 5$   $B = 2$   $C = 0$   $D = -2$   
 amp = 5  
 period =  $\frac{2\pi}{2} = \pi$   
 frequency =  $\frac{1}{\pi}$   
 phase shift = 0  
 vertical shift = -2



23.

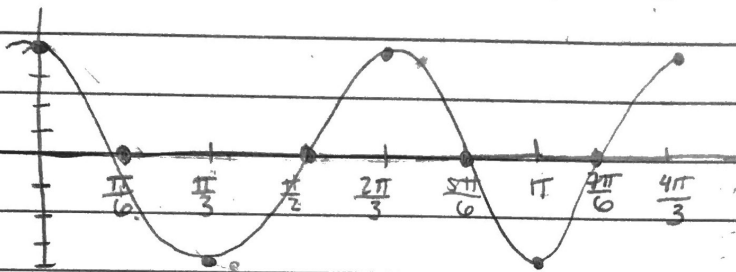
(F)



24.  $y = 4\cos(3t)$

per =  $\frac{2\pi}{3}$

a)



b)  $\frac{2\pi}{3} = 2.1 \text{ sec}$

c)  $y = A\cos(\sqrt{\frac{E}{m}}x)$  as  $m$  increases, the fraction  $\sqrt{\frac{E}{m}}$  gets smaller. This will increase the period.

25.  $h = a\sin(bt) + \frac{11}{2}$

min = 1

max = 10

amp =  $\frac{\text{max} - \text{min}}{2} = \frac{10 - 1}{2} = 4.5$

per =  $\frac{2\pi}{b}$

4 =  $\frac{2\pi}{b}$

$b = \frac{\pi}{2}$