Review for Chapter 2

1. Find cot(80°)

$\frac{1}{\tan 80^\circ} = 0.1763$

2. Find csc(155°)

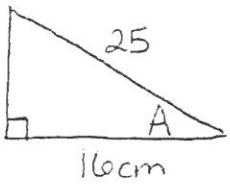
$\frac{1}{\sin 155^\circ} = 2.3662$

3. Find sec(200°)

$\frac{1}{\cos 200^\circ} = -1.0642$

Solve for the missing variable.

4.

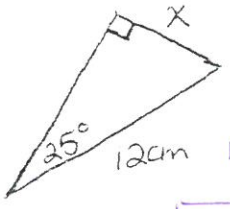


$\cos A = \frac{16}{25}$

$A = \cos^{-1}\left(\frac{16}{25}\right)$

$A = 50.2^\circ$

5.

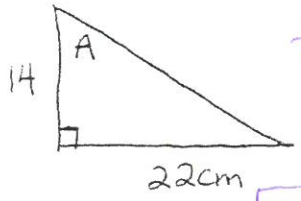


$\sin 25^\circ = \frac{x}{12}$

$12(\sin 25^\circ) = x$

$x = 5.07\text{ cm}$

6.

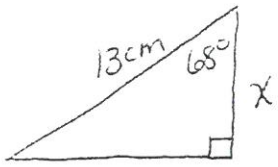


$\tan A = \frac{22}{14}$

$A = \tan^{-1}\left(\frac{22}{14}\right)$

$A = 57.5^\circ$

7.

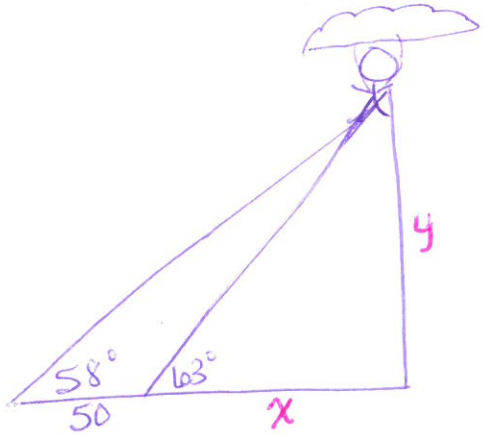


$\cos 68^\circ = \frac{x}{13}$

$13(\cos 68^\circ) = x$

$x = 4.87\text{ cm}$

8. From a point on the beach, the angle of elevation to the top of someone parasailing is 58°. From a point 50 feet closer to the parasailer the angle of elevation is 63°. Calculate the height of the parasailer perpendicular to the ground.



$\tan 58^\circ = \frac{y}{x+50}$ $\quad \tan 63^\circ = \frac{y}{x}$

$\tan 58^\circ(x+50) = y$ $\quad \tan 63^\circ x = y$

$\tan 58^\circ(x+50) = \tan 63^\circ x$

$\tan 58^\circ x + 80.0167 = \tan 63^\circ x$

$80.0167 = \tan 63^\circ x - \tan 58^\circ x$

$80.0167 = 0.3623x$

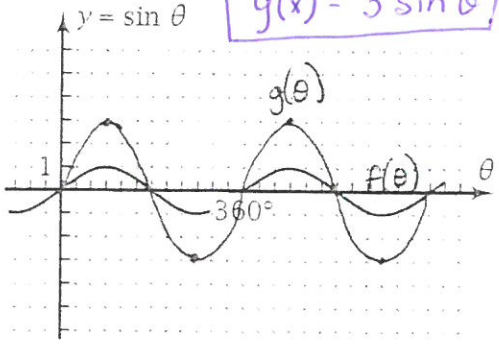
$x = 220.87$ $\quad y = \tan 63^\circ(220.87)$

$y = 433.49\text{ ft}$

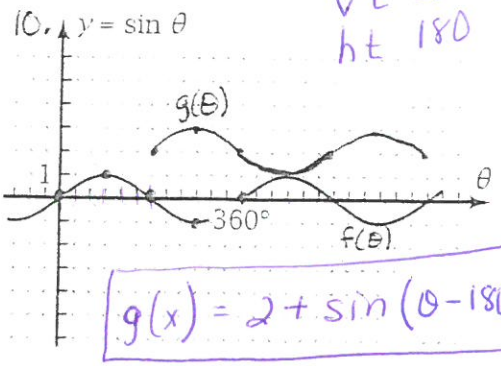
The parent graph of sine or cosine is given as $f(\theta)$. Function $g(\theta)$ is also graphed after being transformed from the parent graph. Write an equation for $g(\theta)$.

9. $g(x) = 3\sin\theta$

vd 3



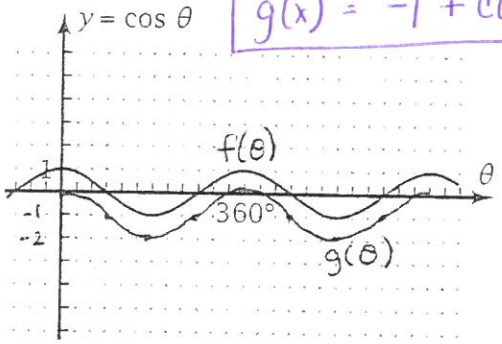
10. vt 2, ht 180



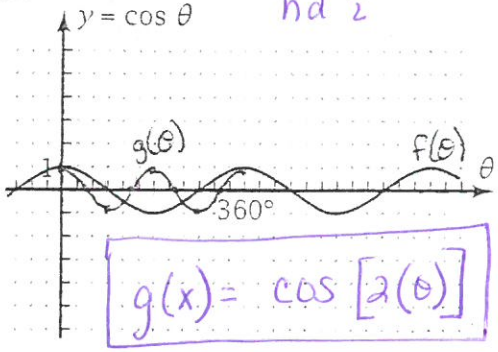
$g(x) = 2 + \sin(\theta - 180^\circ)$

11. $g(x) = -1 + \cos\theta$

vt -1



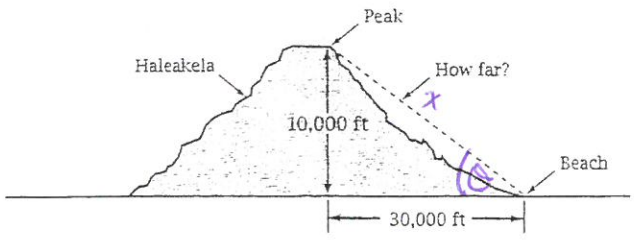
12. hd $\frac{1}{2}$



$g(x) = \cos[2(\theta)]$

13. *Volcano Problem:* Haleakela (pronounced "hallay-ah-keh-la") is a 10,000-ft-high dormant volcano on Maui, Hawaii (Figure 2-5e). The horizontal distance from the peak of the volcano to the ocean is about 30,000 ft.

Figure 2-5e



a. At what angle would you have to look up to see the peak if you were standing on the beach?

b. What is the straight-line distance from the beach to the peak?

a) $\tan\theta = \frac{10,000}{30,000}$

$\theta = \tan^{-1}\left(\frac{1}{3}\right)$

$\theta = 18.4^\circ$

b) $(10,000)^2 + (30,000)^2 = x^2$

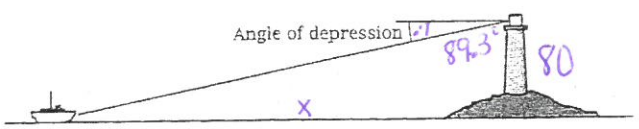
$x = 31,622.78$ ft

OR $\cos 18.4 = \frac{30,000}{x}$

$x = \frac{30,000}{\cos 18.4} = 31,616.35$ ft

14. *Lighthouse Problem:* An observer in a lighthouse 80 ft above the surface of the water measures an angle of depression of 0.7° to a distant ship (Figure 2-5c). How many miles is the ship from the base of the lighthouse? (A mile is 5280 ft.)

Figure 2-5c



$\tan 89.3 = \frac{x}{80}$

$80(\tan 89.3) = x$

$x = 6547.76$ ft