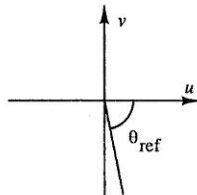
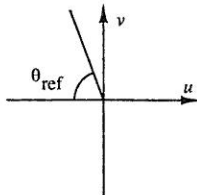


- b. $1000 \text{ m} \cdot \csc 21^\circ = 2790.4281\dots \text{ m} \approx 2790 \text{ m}$
20. a. $2 \cdot \left(25,000,000 \text{ mi} \cdot \tan \left(\frac{0^\circ 1' 2.5''}{2} \right) \right)$
 $= 7575.2138\dots \text{ mi} \approx 7575 \text{ mi}$
- b. $2 \cdot \left(390,000,000 \text{ mi} \cdot \tan \left(\frac{0^\circ 0' 46.9''}{2} \right) \right)$
 $= 88,677.2707\dots \text{ mi} \approx 88,700 \text{ mi}$
- c. Venus diameter $\approx 7565 \text{ mi}$;
 Jupiter diameter $\approx 88,750 \text{ mi}$
21. a. $3 \text{ ft} \cdot \tan 25^\circ = 1.3989\dots \text{ ft} \approx 1 \text{ ft } 5 \text{ in.}$
- b. $3 \text{ ft} \cdot \tan 70^\circ = 8.2424\dots \text{ ft} \approx 8 \text{ ft } 3 \text{ in.}$
- c. $8.2424\dots \text{ ft} - 1.3989\dots \text{ ft} = 6.8435\dots \text{ ft}$
 $\approx 8 \text{ ft } 3 \text{ in.} - 1 \text{ ft } 5 \text{ in.} = 6 \text{ ft } 10 \text{ in.}$
22. a. $\sin^{-1} \frac{28}{55} = 30.6032\dots^\circ \approx 30.6^\circ$
- b. $\sqrt{(55 \text{ in.})^2 - (28 \text{ in.})^2} = \sqrt{2241} \text{ in.}$
 $= 47.3392\dots \text{ in.} \approx 47 \text{ in.}$
- c. $\sqrt{(55 \text{ in.})^2 - (13 \text{ in.})^2} = \sqrt{2856} \text{ in.}$
 $= 53.4415\dots \text{ in.} \approx 53 \text{ in.}$
23. Answers will vary.
24. a. $115 \text{ m} \cdot \tan 51^\circ 50' = 146.3140\dots \text{ m} \approx 146 \text{ m}$
- b. $115 \text{ m} \cdot \sec 51^\circ 50' = 186.0988\dots \text{ m} \approx 186 \text{ m}$
- c. $\tan^{-1} \frac{186.0988\dots}{115} = \tan^{-1} \frac{115 \cdot \sec 51^\circ 50'}{115}$
 $= \tan^{-1} \sec 51^\circ 50' = 58.2859\dots^\circ \approx 58.3^\circ$
- d. $\frac{186.0988}{115} = \frac{115 \cdot \sec 51^\circ 50'}{115} = \sec 51^\circ 50'$
 $= 1.6182\dots$
 $\frac{\sqrt{5} + 1}{2} = 1.6180\dots$
- e. Answers will vary.

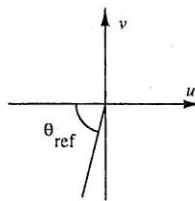
Problem Set 2-6

Review Problems

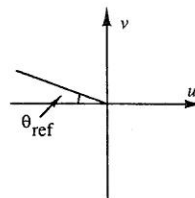
- R1. a. The graphs match.
- b. y -dilation by 0.7, y -translation by +2;
 $y = 2 + 0.7 \sin \theta$; the result agrees with the graph.
- c. Sinusoid
- R2. a. $\theta_{\text{ref}} = 70^\circ$ b. $\theta_{\text{ref}} = 79^\circ$



- c. Graph, $\theta_{\text{ref}} = 76^\circ$

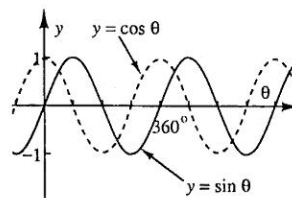


- R3. a. $\sin \theta = \frac{7}{\sqrt{74}} = \frac{7\sqrt{74}}{74}$;
 $\cos \theta = -\frac{5}{\sqrt{74}} = -\frac{5\sqrt{74}}{74}$
- b. $\sin 160^\circ = 0.3420\dots$
 $\cos 160^\circ = -0.9396\dots$
 $\theta_{\text{ref}} = 20^\circ$



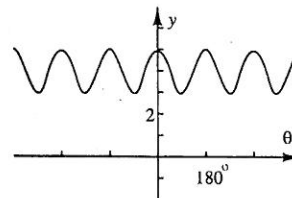
160° terminates within Quadrant II, above the x -axis (so $\sin 160^\circ > 0$) and to the left of the y -axis (so $\cos 160^\circ < 0$).

c.



d. Quadrants III and IV

- e. y -translation of +4, x -dilation of $\frac{1}{2}$



- R4. a. $\csc 256^\circ = -1.0306\dots$
- b. $\sin 150^\circ = \frac{1}{2}$ $\cos 150^\circ = \frac{\sqrt{3}}{2}$
 $\tan 150^\circ = -\frac{\sqrt{3}}{3}$ $\cot 150^\circ = -\sqrt{3}$
 $\sec 150^\circ = -\frac{2\sqrt{3}}{3}$ $\csc 150^\circ = 2$
- c. $\sec \theta = -\sqrt{2}$