

1.7 Trigonometric Functions of Any Angle

1. Answers:

- a. 10°
- b. 60°
- c. 30°
- d. 45°

2. Answers:

- a. $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$
- b. $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$
- c. $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$

3. Answers:

- a. $-\frac{1}{2}$
- b. 0
- c. $\frac{2}{\sqrt{3}}$

4. Answers:

- a. $\frac{1}{2}$
- b. $-\frac{\sqrt{3}}{2}$
- c. $\sqrt{2}$

5. Answers:

- a. $-\frac{\sqrt{3}}{2}$
- b. -1
- c. $\frac{\sqrt{3}}{2}$

6. Answers:

- a. 0.8828
- b. 1.4281
- c. -0.1736

7. About 11.54 degrees or about 168.46 degrees.

8. This is reasonable because $\tan 45^\circ = 1$ and the $\tan 60^\circ = \sqrt{3} \approx 1.732$, and the $\tan 50^\circ$ should fall between these two values.

9. Conjecture: $\sin a + \sin b \neq \sin(a + b)$

10. Answer:

TABLE 1.1:

a	$(\sin a)^2$	$(\cos a)^2$
0	0	1
25	.1786	.8216
45	$\frac{1}{2}$	$\frac{1}{2}$

TABLE 1.1: (continued)

a	$(\sin a)^2$	$(\cos a)^2$
80	.9698	.0302
90	1	0
120	.75	.25
250	.8830	.1170

Conjecture: $(\sin a)^2 + (\cos a)^2 = 1$.