

Spiral Review

Use the calculator to evaluate each function. Round answers to four decimal places.

a.) $\sin 10^\circ$

$$\boxed{\sin}(10) = \boxed{.1736}$$

b.) $\cos 80^\circ$

$$\boxed{\cos}(80) = \boxed{.1736}$$

c.) $\sec 42^\circ 12'$

$$1 \div \boxed{\cos}(42^\circ 12') = \boxed{1.3499}$$

d.) $\csc 48^\circ 7' 30''$

$$1 \div \boxed{\sin}(48^\circ 7' 30'') = \boxed{1.3430}$$

p. 270 (9-31, 47-51 odds)

9. $(-\frac{8}{17}, \frac{15}{17})$

$\sin\theta = \frac{15}{17}$

$\cos\theta = -\frac{8}{17}$

$\tan\theta = -\frac{15}{8}$

$\csc\theta = \frac{17}{15}$

$\sec\theta = -\frac{17}{8}$

$\cot\theta = -\frac{8}{15}$

11. $(\frac{1}{13}, -\frac{5}{13})$

$\sin\theta = -\frac{5}{13}$

$\cos\theta = \frac{12}{13}$

$\tan\theta = -\frac{5}{12}$

$\csc\theta = -\frac{13}{5}$

$\sec\theta = \frac{13}{12}$

$\cot\theta = -\frac{12}{5}$

13. $t = \frac{\pi}{6}$ QI
 $(\frac{\sqrt{3}}{2}, \frac{1}{2})$

15. $t = \frac{7\pi}{6}$ QIII
 $(-\frac{\sqrt{3}}{2}, -\frac{1}{2})$

17. $t = \frac{3\pi}{2}$ y-axis (bottom)
 $(0, -1)$

19. $t = -\frac{\pi}{4}$ QI
 $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$

21. 4π x-axis (right)
 $(1, 0)$

23. $t = \frac{\pi}{4}$ QI (t, t) $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$

$\sin\theta = \frac{\sqrt{2}}{2}$

$\cos\theta = \frac{\sqrt{2}}{2}$

$\tan\theta = 1$

25. $t = -\frac{\pi}{4}$ QI (t, t) $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$

$\sin\theta = \frac{\sqrt{2}}{2}$

$\cos\theta = \frac{\sqrt{2}}{2}$

$\tan\theta = 1$

27. $t = \frac{2\pi}{3}$ QII (-, +) $(-\frac{1}{2}, \frac{\sqrt{3}}{2})$

$\sin\theta = \frac{\sqrt{3}}{2}$

$\cos\theta = -\frac{1}{2}$

$\tan\theta = -\sqrt{3}$

29. $t = -\frac{\pi}{2}$ y-axis (bottom) $(0, -1)$

$\sin\theta = -1$

$\cos\theta = 0$

$\tan\theta = \text{undefined}$

31. $t = -\frac{\pi}{6}$ QIV (t, -) $(\frac{\sqrt{3}}{2}, -\frac{1}{2})$

$\sin\theta = -\frac{1}{2}$

$\cos\theta = \frac{\sqrt{3}}{2}$

$\tan\theta = -\frac{\sqrt{3}}{3}$

33. $t = \frac{3\pi}{4}$ QII (-, +) $(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$

$\sin\theta = \frac{\sqrt{2}}{2}$

$\cos\theta = -\frac{\sqrt{2}}{2}$

$\tan\theta = -1$

$\csc\theta = \sqrt{2}$

$\sec\theta = -\sqrt{2}$

$\cot\theta = -1$

35. $t = \pi$ x-axis(right) (1,0)

$$\sin\theta = 0$$

$$\cos\theta = 1$$

$$\tan\theta = 0$$

$$\csc\theta = \text{undefined}$$

$$\sec\theta = 1$$

$$\cot\theta = \text{undefined}$$

37. $t = \frac{4\pi}{3}$ QII (-,+) $(-\frac{1}{2}, \frac{\sqrt{3}}{2})$

$$\sin\theta = \frac{\sqrt{3}}{2}$$

$$\cos\theta = -\frac{1}{2}$$

$$\tan\theta = -\sqrt{3}$$

$$\csc\theta = \frac{2\sqrt{3}}{3}$$

$$\sec\theta = -2$$

$$\cot\theta = -\frac{\sqrt{3}}{3}$$

47. $\sin t = \frac{1}{3}$

a) $-\frac{1}{3}$

b) -3

49. $\cos(-t) = -\frac{1}{5}$

a) $-\frac{1}{5}$

b) -5

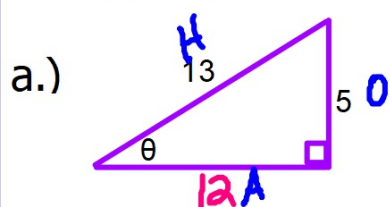
51. $\tan t = \frac{4}{5}$

a) $-\frac{4}{5}$

b) $\frac{5}{4}$

Student will be able to find the exact values of the six trigonometric functions.

Example 1: Find the exact values of the six trigonometric functions of the angle θ .



① Find third side.

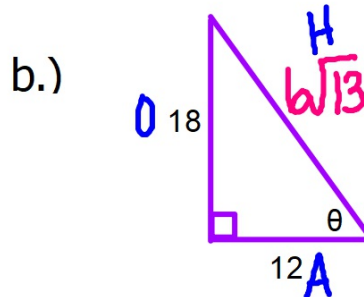
$$a^2 + 5^2 = 13^2$$

$$a = 12$$

$$\textcircled{a} \quad \sin\theta = \frac{5}{13} \quad \csc\theta = \frac{13}{5}$$

$$\cos\theta = \frac{12}{13} \quad \sec\theta = \frac{13}{12}$$

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



$$\textcircled{1} \quad 12^2 + 18^2 = c^2$$

$$c = 6\sqrt{13}$$

$$\textcircled{2} \quad \sin\theta = \frac{18}{6\sqrt{13}} = \frac{3\sqrt{13}}{13} \quad \csc\theta = \frac{\sqrt{13}}{3}$$

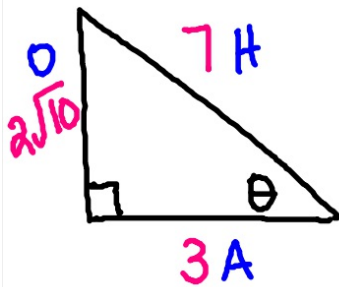
$$\cos\theta = \frac{12}{6\sqrt{13}} = \frac{2\sqrt{13}}{13} \quad \sec\theta = \frac{\sqrt{13}}{2}$$

$$\tan\theta = \frac{18}{12} = \frac{3}{2} \quad \cot\theta = \frac{2}{3}$$

Student will be able to find the exact values of the six trigonometric functions.

Example 2: Sketch a right triangle corresponding to the trigonometric function and then find all six trigonometric functions.

a.) $\cos\theta = \frac{3}{7} \frac{A}{H}$



① Find third side.

$$3^2 + b^2 = 7^2$$

$$b = 2\sqrt{10}$$

② $\sin\theta = \frac{2\sqrt{10}}{7}$ $\csc\theta = \frac{7\sqrt{10}}{20}$

$$\cos\theta = \frac{3}{7}$$

$$\sec\theta = \frac{7}{3}$$

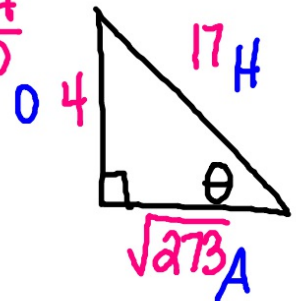
$$\tan\theta = \frac{2\sqrt{10}}{3}$$

$$\cot\theta = \frac{3\sqrt{10}}{20}$$

b.) $\csc\theta = \frac{17}{4} \frac{H}{O}$

$$\textcircled{1} 4^2 + b^2 = 17^2$$

$$b = \sqrt{273}$$



② $\sin\theta = \frac{4}{17}$ $\csc\theta = \frac{17}{4}$

$$\cos\theta = \frac{\sqrt{273}}{17}$$

$$\sec\theta = \frac{17\sqrt{273}}{273}$$

$$\tan\theta = \frac{4\sqrt{273}}{273}$$

$$\cot\theta = \frac{\sqrt{273}}{4}$$

Student will be able to use the fundamental identities of trigonometry.

Example 3: Complete the identity.

a.) $\cos\theta = \frac{1}{?}$

$\sec\theta$

b.) $\cot\theta = \frac{?}{?}$

$\frac{\cos\theta}{\sin\theta}$

c.) $1 + \tan^2\theta = ?$

$\sec^2\theta$

d.) $\cos(90^\circ - \theta) = ?$

$\sin\theta$

Student will be able to use the function values and the trigonometric identities to evaluate each function.

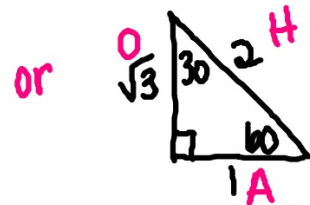
Example 4: Use the function value and the identities to evaluate each function.

$$1.) \sin 60^\circ = \frac{\sqrt{3}}{2}, \cos 60^\circ = \frac{1}{2}$$

$$a.) \tan 60^\circ = \frac{\sin 60^\circ}{\cos 60^\circ} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \boxed{\sqrt{3}}$$

$$b.) \sin 30^\circ \text{ (use cofunction)}$$

$$\sin 30^\circ = \cos 60^\circ = \boxed{\frac{1}{2}}$$



$$c.) \cos 30^\circ \text{ (use cofunction or } \Delta)$$

$$\cos 30^\circ = \sin 60^\circ = \boxed{\frac{\sqrt{3}}{2}}$$

$$d.) \cot 60^\circ$$

$$\frac{\cos 60^\circ}{\sin 60^\circ} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \boxed{\frac{\sqrt{3}}{3}}$$

Student will be able to use the function values and the trigonometric identities to evaluate each function.

$$2.) \sec\theta = 5, \tan\theta = 2\sqrt{6}$$
$$\cos\theta = \frac{1}{5} \quad \cot\theta = \frac{1}{2\sqrt{6}} = \frac{\sqrt{6}}{12}$$

① You should already know 2 more from the given! (flip it)

a.) $\cos\theta$

$$\boxed{\frac{1}{5}}$$

b.) $\cot\theta$

$$\boxed{\frac{\sqrt{6}}{12}}$$

c.) $\cot(90^\circ - \theta)$ ← cofunction

$$\tan\theta = \boxed{2\sqrt{6}}$$

d.) $\sin\theta$ ← use Pythagorean Identity

$$\sin^2\theta + \cos^2\theta = 1$$

$$\sin^2\theta + \left(\frac{1}{5}\right)^2 = 1$$

$$\sqrt{\sin^2\theta} = \sqrt{\frac{24}{25}}$$

$$\boxed{\sin\theta = \frac{2\sqrt{6}}{5}}$$

Turn-in:

p. 280 (14, 40, 52, 54)

HW:

p.280 (7-19, 37-57 odds)