

1. Suppose that  $0 < \theta < \frac{\pi}{2}$ . Draw a right-angled triangle that has  $\theta$  as one of its angles.

(a)  $\cos \theta = \frac{3}{5}$       (b)  $\sec \theta = \frac{41}{40}$ ,      (c)  $\sin \theta = \frac{15}{17}$       (d)  $\tan \theta = \frac{1}{3}$       (e)  $\csc \theta = \frac{3}{2}$

2. Suppose that  $\theta$  is in the first quadrant. Determine all remaining trigonometric ratios.

(In other words, determine  $\sin \theta$ ,  $\cos \theta$ ,  $\tan \theta$ ,  $\csc \theta$ ,  $\sec \theta$ ,  $\cot \theta$ .)

(a)  $\sin \theta = \frac{5}{13}$       (b)  $\tan \theta = \sqrt{3}$       (c)  $\csc \theta = \frac{3}{2}$       (d)  $\sec \theta = \frac{6}{5}$       (e)  $\tan \theta = 6$

3. Determine all remaining trigonometric ratios.

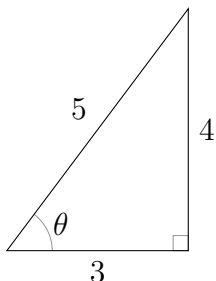
(a)  $\sin \theta = \frac{3}{5}$  with  $\theta$  in Quadrant II      (b)  $\tan \theta = \frac{12}{5}$  with  $\pi < \theta < \frac{3\pi}{2}$

(c)  $\tan \theta = -2$  with  $\theta$  in Quadrant IV      (d)  $\sec \theta = -4$  with  $\theta$  in Quadrant II

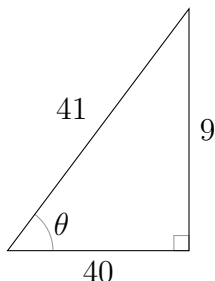
(e)  $\cos \theta = \frac{1}{3}$  with  $0 < \theta < \frac{\pi}{2}$       (f)  $\csc \theta = 5$  with  $\frac{\pi}{2} < \theta < \pi$

# Answers

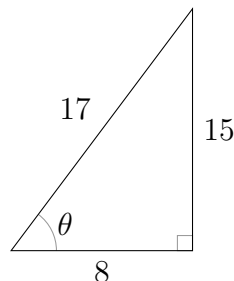
1. (a)



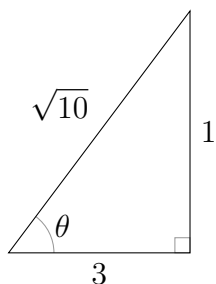
(b)



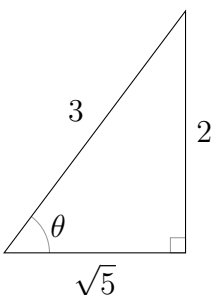
(c)



(d)



(e)



2. (a)  $\sin \theta = \frac{5}{13}$ ,  $\cos \theta = \frac{12}{13}$ ,  $\tan \theta = \frac{5}{12}$ ,  $\csc \theta = \frac{13}{5}$ ,  $\sec \theta = \frac{13}{12}$ ,  $\cot \theta = \frac{12}{5}$

(b)  $\sin \theta = \frac{\sqrt{3}}{2}$ ,  $\cos \theta = \frac{1}{2}$ ,  $\tan \theta = \sqrt{3}$ ,  $\csc \theta = \frac{2}{\sqrt{3}}$ ,  $\sec \theta = 2$ ,  $\cot \theta = \frac{1}{\sqrt{3}}$

(c)  $\sin \theta = \frac{2}{3}$ ,  $\cos \theta = \frac{\sqrt{5}}{3}$ ,  $\tan \theta = \frac{2}{\sqrt{5}}$ ,  $\csc \theta = \frac{3}{2}$ ,  $\sec \theta = \frac{3}{\sqrt{5}}$ ,  $\cot \theta = \frac{\sqrt{5}}{2}$

(d)  $\sin \theta = \frac{\sqrt{11}}{6}$ ,  $\cos \theta = \frac{5}{6}$ ,  $\tan \theta = \frac{\sqrt{11}}{5}$ ,  $\csc \theta = \frac{6}{\sqrt{11}}$ ,  $\sec \theta = \frac{6}{5}$ ,  $\cot \theta = \frac{5}{\sqrt{11}}$

(e)  $\sin \theta = \frac{6}{\sqrt{37}}$ ,  $\cos \theta = \frac{1}{\sqrt{37}}$ ,  $\tan \theta = 6$ ,  $\csc \theta = \frac{\sqrt{37}}{6}$ ,  $\sec \theta = \sqrt{37}$ ,  $\cot \theta = \frac{1}{6}$

3. (a)  $\sin \theta = \frac{3}{5}$ ,  $\cos \theta = -\frac{4}{5}$ ,  $\tan \theta = -\frac{3}{4}$ ,  $\csc \theta = \frac{5}{3}$ ,  $\sec \theta = -\frac{5}{4}$ ,  $\cot \theta = -\frac{4}{3}$

(b)  $\sin \theta = -\frac{12}{13}$ ,  $\cos \theta = -\frac{5}{13}$ ,  $\tan \theta = \frac{12}{5}$ ,  $\csc \theta = -\frac{13}{12}$ ,  $\sec \theta = -\frac{13}{5}$ ,  $\cot \theta = \frac{5}{12}$

(c)  $\sin \theta = -\frac{2}{\sqrt{5}}$ ,  $\cos \theta = \frac{1}{\sqrt{5}}$ ,  $\tan \theta = -2$ ,  $\csc \theta = -\frac{\sqrt{5}}{2}$ ,  $\sec \theta = \sqrt{5}$ ,  $\cot \theta = -\frac{1}{2}$

(d)  $\sin \theta = \frac{\sqrt{15}}{4}$ ,  $\cos \theta = -\frac{1}{4}$ ,  $\tan \theta = -\sqrt{15}$ ,  $\csc \theta = \frac{4}{\sqrt{15}}$ ,  $\sec \theta = -4$ ,  $\cot \theta = -\frac{1}{\sqrt{15}}$

(e)  $\sin \theta = \frac{2\sqrt{2}}{3}$ ,  $\cos \theta = \frac{1}{3}$ ,  $\tan \theta = 2\sqrt{2}$ ,  $\csc \theta = \frac{3}{2\sqrt{2}}$ ,  $\sec \theta = 3$ ,  $\cot \theta = \frac{1}{2\sqrt{2}}$

(f)  $\sin \theta = \frac{1}{5}$ ,  $\cos \theta = -\frac{2\sqrt{6}}{5}$ ,  $\tan \theta = -\frac{1}{2\sqrt{6}}$ ,  $\csc \theta = 5$ ,  $\sec \theta = -\frac{5}{2\sqrt{6}}$ ,  $\cot \theta = -2\sqrt{6}$