

3. Evaluate.

- (a) $\sin^{-1} 0.2164$ (b) $\cos^{-1} 0.6730$
 (c) $\tan^{-1} 0.4621$ (d) $\csc^{-1} 1.4501$
 (e) $\cot^{-1} 1.4501$ (f) $\sec^{-1} 1.1315$
 (g) $\cos^{-1} 0.7869$ (h) $\tan^{-1} 1.1423$

4. Evaluate.

- (a) $\cos^{-1} 0.2774$ (b) $\sin^{-1} 0.8742$
 (c) $\csc^{-1} 1.7521$ (d) $\tan^{-1} 1.4324$
 (e) $\cot^{-1} 0.3724$ (f) $\sec^{-1} 2.4265$
 (g) $\cos^{-1} 0.7853$ (h) $\sin^{-1} 0.4207$

(e) 24;

$$\sin u = \frac{7}{25} \quad \csc u = \frac{25}{7} \quad \sin s = \frac{24}{25} \quad \csc s = \frac{25}{24}$$

$$\cos u = \frac{24}{25} \quad \sec u = \frac{25}{24} \quad \cos s = \frac{7}{25} \quad \sec s = \frac{25}{7}$$

$$\tan u = \frac{7}{24} \quad \cot u = \frac{24}{7} \quad \tan s = \frac{24}{7} \quad \cot s = \frac{7}{24}$$

4. $\cos \theta = \frac{\sqrt{3}}{2}, \tan \theta = \frac{1}{\sqrt{3}}, \csc \theta = 2, \sec \theta = \frac{2}{\sqrt{3}}, \cot \theta = \sqrt{3}$

5. $\cos \theta = \frac{5}{13}, \sin \theta = \frac{12}{13}, \tan \theta = \frac{12}{5}, \csc \theta = \frac{13}{12}, \cot \theta = \frac{5}{12}$

6. $\cos \theta = \frac{1}{\sqrt{5}}, \sin \theta = \frac{2}{\sqrt{5}}, \csc \theta = \frac{\sqrt{5}}{2}, \sec \theta = \sqrt{5}, \cot \theta = \frac{1}{2}$

7. $\sin \theta = \frac{1}{2}, \tan \theta = \frac{1}{\sqrt{3}}, \csc \theta = 2, \sec \theta = \frac{2}{\sqrt{3}}, \cot \theta = \sqrt{3}$

EXERCISE 9.1

1. (a) $\sin \theta = \frac{5}{\sqrt{61}}, \csc \theta = \frac{\sqrt{61}}{5}$
 $\cos \theta = \frac{6}{\sqrt{61}}, \sec \theta = \frac{\sqrt{61}}{6}$
 $\tan \theta = \frac{5}{6}, \cot \theta = \frac{6}{5}$

(b) $\sin \theta = \frac{2}{\sqrt{13}}, \csc \theta = \frac{\sqrt{13}}{2}$
 $\cos \theta = \frac{3}{\sqrt{13}}, \sec \theta = \frac{\sqrt{13}}{3}$
 $\tan \theta = \frac{2}{3}, \cot \theta = \frac{3}{2}$

(c) $\sin \theta = \frac{4}{\sqrt{41}}, \csc \theta = \frac{\sqrt{41}}{4}$
 $\cos \theta = \frac{5}{\sqrt{41}}, \sec \theta = \frac{\sqrt{41}}{5}$
 $\tan \theta = \frac{4}{5}, \cot \theta = \frac{5}{4}$

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

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

(f) $\sin \theta = \frac{5}{\sqrt{26}}, \csc \theta = \frac{\sqrt{26}}{5}$
 $\cos \theta = \frac{1}{\sqrt{26}}, \sec \theta = \sqrt{26}$
 $\tan \theta = 5, \cot \theta = \frac{1}{5}$

(g) $\sin \theta = \frac{\sqrt{21}}{5}, \csc \theta = \frac{5}{\sqrt{21}}$
 $\cos \theta = \frac{2}{5}, \sec \theta = \frac{5}{2}$
 $\tan \theta = \frac{\sqrt{21}}{2}, \cot \theta = \frac{2\sqrt{21}}{21}$

(h) $\sin \theta = \frac{8}{\sqrt{113}}, \csc \theta = \frac{\sqrt{113}}{8}$
 $\cos \theta = \frac{7}{\sqrt{113}}, \sec \theta = \frac{\sqrt{113}}{7}$
 $\tan \theta = \frac{8}{7}, \cot \theta = \frac{7}{8}$

2. (a) 10; $\sin \theta = \frac{3}{5}, \csc \theta = \frac{5}{3}$
 $\cos \theta = \frac{4}{5}, \sec \theta = \frac{5}{4}$
 $\tan \theta = \frac{3}{4}, \cot \theta = \frac{4}{3}$

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

(c) 15; $\sin \theta = \frac{15}{17}, \csc \theta = \frac{17}{15}$
 $\cos \theta = \frac{8}{17}, \sec \theta = \frac{17}{8}$
 $\tan \theta = \frac{15}{8}, \cot \theta = \frac{8}{15}$

(d) 15; $\sin \theta = \frac{3}{5}, \csc \theta = \frac{5}{3}$
 $\cos \theta = \frac{4}{5}, \sec \theta = \frac{5}{4}$
 $\tan \theta = \frac{3}{4}, \cot \theta = \frac{4}{3}$

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

(b) 12; $\sin A = \frac{12}{13}, \csc A = \frac{13}{12}, \sin B = \frac{5}{13}, \csc B = \frac{13}{5}$
 $\cos A = \frac{5}{13}, \sec A = \frac{13}{5}, \cos B = \frac{12}{13}, \sec B = \frac{13}{12}$
 $\tan A = \frac{12}{5}, \cot A = \frac{5}{12}, \tan B = \frac{5}{12}, \cot B = \frac{12}{5}$

(c) 8; $\sin B = \frac{6}{17}, \csc B = \frac{17}{6}, \sin C = \frac{15}{17}, \csc C = \frac{17}{15}$
 $\cos B = \frac{15}{17}, \sec B = \frac{17}{15}, \cos C = \frac{8}{17}, \sec C = \frac{17}{8}$
 $\tan B = \frac{6}{15}, \cot B = \frac{15}{6}, \tan C = \frac{15}{8}, \cot C = \frac{8}{15}$

(d) 8; $\sin P = \frac{4}{5}, \csc P = \frac{5}{4}, \sin R = \frac{3}{5}, \csc R = \frac{5}{3}$
 $\cos P = \frac{3}{5}, \sec P = \frac{5}{3}, \cos R = \frac{4}{5}, \sec R = \frac{5}{4}$
 $\tan P = \frac{4}{3}, \cot P = \frac{3}{4}, \tan R = \frac{3}{4}, \cot R = \frac{4}{3}$

- (e) 0.9466
 (e) 39.0°
 (f) 0.6032
 (f) 16.0°
 (d) 43.5991
 (h) 48.8002
 (d) 55.0800
 (h) 24.8788

- (d) 3.1716
 (d) 25.0°
 (c) 24.8017
 (g) 38.1033
 (c) 34.8021
 (g) 38.2516

- (c) 1.357
 (c) 65.0°
 (b) 3.7321
 (b) 60.0°
 (b) 47.7010
 (f) 27.8979
 (b) 60.9504
 (f) 65.6621

EXERCISE 9.3

1. (a) 0.4226
 2. (a) 65.0°
 3. (a) 12.4977
 (e) 34.5904
 4. (a) 73.8949
 (e) 69.5747