

$$7. \sin \theta = \frac{11}{\sqrt{170}} = 0.8436\dots; \cos \theta = \frac{7}{\sqrt{170}} = 0.5368\dots$$

$$9. \sin \theta = \frac{5}{\sqrt{29}} = 0.9284\dots; \cos \theta = \frac{-2}{\sqrt{29}} = -0.3713\dots$$

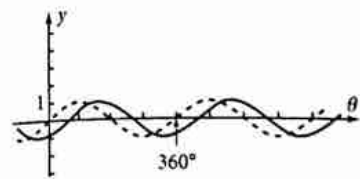
$$11. \sin \theta = \frac{-8}{4\sqrt{5}} = \frac{-2}{\sqrt{5}} = -0.8944\dots;$$

$$\cos \theta = \frac{4}{4\sqrt{5}} = \frac{1}{\sqrt{5}} = 0.4472\dots$$

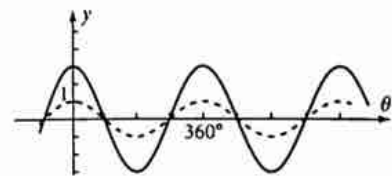
$$13. \sin \theta = \frac{-7}{25} = -0.28; \cos \theta = \frac{-24}{25} = -0.96;$$

r is an integer

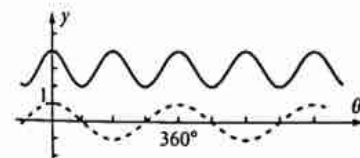
15. θ -translation of $y = \sin \theta$ by $+60^\circ$



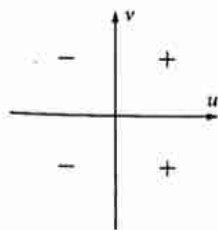
17. y -dilation of $y = \cos \theta$ by 3



19. θ -dilation of $y = \cos \theta$ by $\frac{1}{2}$, y -translation by $+3$



21.



23. Examples will vary.

Problem Set 5-4

1. ≈ 1.2799

3. ≈ -1.8871

5. ≈ -57.2987

$$7. \sin \theta = -\frac{3}{5}; \cos \theta = \frac{4}{5}; \tan \theta = -\frac{3}{4};$$

$$\cot \theta = -\frac{4}{3}; \sec \theta = \frac{5}{4}; \csc \theta = -\frac{5}{3}$$

$$9. \sin \theta = -\frac{7}{\sqrt{74}}; \cos \theta = -\frac{5}{\sqrt{74}};$$

$$\tan \theta = \frac{7}{5}; \cot \theta = \frac{5}{7}; \sec \theta = -\frac{\sqrt{74}}{5};$$

$$\csc \theta = -\frac{\sqrt{74}}{7}$$

$$11. \sin \theta = \frac{4}{5}; \cos \theta = -\frac{3}{5}; \tan \theta = -\frac{4}{3};$$

$$\cot \theta = -\frac{3}{4}; \sec \theta = -\frac{5}{3}; \csc \theta = \frac{5}{4}$$

$$13. \sin \theta = -\frac{\sqrt{15}}{4}; \cos \theta = \frac{1}{4}; \tan \theta = -\sqrt{15};$$

$$\cot \theta = -\frac{1}{\sqrt{15}}; \sec \theta = 4; \csc \theta = -\frac{4}{\sqrt{15}}$$

$$15. \sin 60^\circ = \frac{\sqrt{3}}{2}; \cos 60^\circ = \frac{1}{2}; \tan 60^\circ = \sqrt{3};$$

$$\cot 60^\circ = \frac{1}{\sqrt{3}}; \sec 60^\circ = 2; \csc 60^\circ = \frac{2}{\sqrt{3}}$$

$$17. \sin(-315^\circ) = \frac{1}{\sqrt{2}}; \cos(-315^\circ) = \frac{1}{\sqrt{2}};$$

$$\tan(-315^\circ) = 1; \cot(-315^\circ) = 1; \sec(-315^\circ) = \sqrt{2};$$

$$\csc(-315^\circ) = \sqrt{2}$$

$$19. \sin 180^\circ = 0; \cos 180^\circ = -1; \tan 180^\circ = 0;$$

$$\cot 180^\circ \text{ is undefined}; \sec 180^\circ = -1; \csc 180^\circ \text{ is undefined.}$$

21. 0

23. $-\frac{1}{2}$

25. -1

27. undefined

29. $-\frac{2}{\sqrt{3}}$

31. $\sqrt{2}$

33a. $\theta = 0^\circ, 180^\circ, 360^\circ$

33b. $\theta = 90^\circ, 270^\circ$

33c. $\theta = 0^\circ, 180^\circ, 360^\circ$

33d. $\theta = 90^\circ, 270^\circ$

33e. $\sec \theta \neq 0$ for all θ

33f. $\csc \theta \neq 0$ for all θ

35. 1

37. 2

39. 1

41. -1

43a. 67°

43b. $\cos 23^\circ = 0.93205\dots, \sin 67^\circ = 0.9205\dots;$
They are equal.

43c. "Complement"

45. In the uv -coordinate plane, θ is the angle from the origin to the point (u, v) in standard position. In the θy -coordinate plane, θ represents the same angle, but is now used as the independent variable.

Problem Set 5-5

1. $17.4576\dots^\circ$, because $\sin 17.4576\dots^\circ = 0.3$

3. $81.8698\dots^\circ$, because $\tan 81.8698\dots^\circ = 7$

5. $\cos(\sin^{-1} 0.8) = 0.6$; $\theta = \sin^{-1} 0.8$ represents an angle of a right triangle with sides 3, 4, and 5.

7a. They are not one-to-one.