

51. a) $270^\circ + 70^\circ = \boxed{340^\circ}$ c) $\pi - \pi/4 = \boxed{3\pi/4}$ e) $-2\frac{1}{2}\pi + \pi/6 = \boxed{-\frac{7}{3}\pi}$

52. a) $110^\circ - 70^\circ = \boxed{20^\circ}$ c) $2\pi - \frac{31\pi}{18} = \boxed{\frac{5\pi}{18}}$ e) $-(\pi - \frac{25\pi}{18}) = \boxed{\frac{7\pi}{18}}$

53. a) 45° c) 90° e) 60° g) 45° h) ~~45°~~ i) 30° k) 45° m) 60°

54. a) 45° c) 45° e) 45° g) 60° i) 45° k) 30° m) 45°

55. a) $-88, -47, -1.88$ c) $-1.00, .09, -11.43$

e) $.39, -.94, -.36$ g) $-.98, -.17, 5.67$

i) $-.39, -.92, .12$

56. a) $\frac{180^\circ}{5} = \boxed{36^\circ}$ c) $6 \cdot \frac{180^\circ}{5} = \boxed{216^\circ}$ e) $10 \cdot \frac{180^\circ}{11} \approx \boxed{163.64^\circ}$

g) $7 \cdot \frac{180^\circ}{3} = \boxed{420^\circ}$ i) $15 \cdot \frac{180^\circ}{6} = \boxed{450^\circ}$ k) $5 \cdot \frac{180^\circ}{2} = \boxed{450^\circ}$

57. a) $\frac{7}{45}\pi$ k) $\frac{1}{18}\pi$ c) $\frac{59}{40}\pi$ g) $-\frac{2}{3}\pi$ i) $\frac{5}{6}\pi$ k) $\frac{1}{6}\pi$

58. a) $\frac{9}{\sqrt{12^2 + 9^2}} = \frac{9}{15} = \boxed{\frac{3}{5}}$ b) ~~$\frac{-3}{-7} = \frac{3}{7}$~~ e) $\frac{-24}{\sqrt{24^2 + 74^2}} = \boxed{-\frac{\sqrt{2}}{2}}$

c) $\frac{-8}{\sqrt{8^2 + 17^2}} = \boxed{-\frac{8}{19}}$

59. a) $\cos(240^\circ) = -\cos(60^\circ) = \boxed{-1/2}$ c) $\sin(180^\circ) = \boxed{0}$ e) $\sin 120^\circ = \sin 60^\circ = \boxed{\frac{\sqrt{3}}{2}}$

60. a) $\sin(-45^\circ) = -\sin(45^\circ) = \boxed{-\frac{\sqrt{2}}{2}}$ c) $\sin \frac{5\pi}{6} = \sin \frac{\pi}{6} = \boxed{1/2}$

e) $\tan \frac{3\pi}{4} = -\tan \frac{\pi}{4} = \boxed{-1}$ g) $\tan \frac{3\pi}{4} = \tan \frac{\pi}{4} = \boxed{1}$

i) $\sin \frac{13\pi}{6} = \sin \frac{\pi}{6} = \boxed{1/2}$ k) $\sin(-\frac{3\pi}{2}) = \sin \frac{\pi}{2} = \boxed{1}$

m) $\cot(-135^\circ) = -\frac{1}{\tan(135^\circ)} = -\frac{1}{-1} = \boxed{1}$ o) $\cos(480^\circ) = \cos 120^\circ = -\cos 60^\circ = \boxed{-1/2}$

q) $\tan(\frac{11\pi}{6}) = \tan \frac{7\pi}{6} = \tan \frac{\pi}{6} = \boxed{\frac{\sqrt{3}}{3}}$ s) $\sin(-\frac{12\pi}{4}) = \sin(-\frac{3\pi}{1}) = -\sin(\frac{3\pi}{1}) = \boxed{-\frac{\sqrt{2}}{2}}$

61. a) $-1/2$ c) 0 e) $\sqrt{2}/2$ g) $\sqrt{3}/3$ h) $-\sqrt{2}/2$ k) -1 m) 0 o) $-\sqrt{3}/3$ q) -1 s) 1

62. a) $\sin d = -\frac{24}{25}$ c) $\cot d = -\frac{24}{7}$ e) $\tan d = -\frac{7}{24}$ g) $\cos d = \frac{7}{25}$

c) $\cos d = \frac{5}{13}$ e) $\tan d = \frac{2}{5}$ g) $\cos d = -\frac{\sqrt{3}}{2}$ i) $\sin d = -\frac{1}{2}$