47. $\tan\theta = \frac{\sqrt{7}}{3}$, $\sec\theta = \frac{4}{3}$. Then $\cos\theta = \frac{3}{4}$ and $\sin\theta = \tan\theta \cdot \cos\theta = \frac{\sqrt{7}}{4}$, $\csc\theta = \frac{4}{\sqrt{7}} = \frac{4\sqrt{7}}{7}$, and $\cot\theta = \frac{3}{\sqrt{7}} = \frac{3\sqrt{7}}{7}$.

49. $\sin\theta = \frac{3}{5}$. Since $\cos\theta < 0$, θ is in quadrant II. Thus, $x = -\sqrt{5^2 - 3^2} = -\sqrt{16} = -4$. Therefore, $\cos\theta = -\frac{4}{5}$, $\tan\theta = -\frac{3}{4}$, $\csc\theta = \frac{5}{3}$, $\sec\theta = -\frac{5}{4}$, $\cot\theta = -\frac{4}{3}$.

51. $\tan\theta = -\frac{1}{2}$. $\sec^2\theta = 1 + \tan^2\theta = 1 + \frac{1}{4} = \frac{5}{4} \quad\Leftrightarrow\quad \cos^2\theta = \frac{4}{5} \quad\Rightarrow\quad \cos\theta = -\sqrt{\frac{4}{5}} = -\frac{2}{\sqrt{5}}$ since $\cos\theta < 0$ in quadrant II. But $\tan\theta = \dfrac{\sin\theta}{\cos\theta} = -\frac{1}{2} \quad\Leftrightarrow\quad \sin\theta = -\frac{1}{2}\cos\theta$ $= -\frac{1}{2}\left(-\frac{2}{\sqrt{5}}\right) = \frac{1}{\sqrt{5}}$. Therefore, $\sin\theta + \cos\theta = \frac{1}{\sqrt{5}} + \left(-\frac{2}{\sqrt{5}}\right) = -\frac{1}{\sqrt{5}} = -\frac{\sqrt{5}}{5}$.

53. By the Pythagorean identity, $\sin^2\theta + \cos^2\theta = 1$ for any angle θ.

55. $\angle B = 180° - 30° - 80° = 70°$, and so by the Law of Sines, $x = \dfrac{10 \cdot \sin 30°}{\sin 70°} \approx 5.32$

57. $x^2 = 100^2 + 210^2 - 2 \cdot 100 \cdot 210 \cdot \cos 40° \approx 21926.133 \quad\Leftrightarrow\quad x \approx 148.07$

59. $\sin B = \dfrac{20 \cdot \sin 60°}{70} \approx 0.247 \quad\Leftrightarrow\quad \angle B \approx \sin^{-1} 0.247 \approx 14.33°$. Then $\angle C \approx 180° - 60° - 14.33° = 105.67°$, and so $x \approx \dfrac{70 \cdot \sin 105.67°}{\sin 60°} \approx 77.82$.