Exercises 7.5

1. $x^2 = 10^2 + 20^2 - 2 \cdot 10 \cdot 20 \cdot \cos 35° = 100 + 400 - 400 \cos 35° \approx 172.339$ and so $x \approx \sqrt{172.239} \approx 13$.

3. $37.83^2 = 68.01^2 + 42.15^2 - 2 \cdot 68.01 \cdot 42.15 \cdot \cos\theta$. Then $\cos\theta = \frac{37.83^2 - 68.01^2 - 42.15^2}{-2 \cdot 68.01 \cdot 42.15} \approx 0.867$ $\Leftrightarrow \quad \theta \approx \cos^{-1} 0.867 \approx 29.89°$.

5. $x^2 = 24^2 + 30^2 - 2 \cdot 24 \cdot 30 \cdot \cos 30° = 576 + 900 - 1440 \cos 30° \approx 228.923$ and so $x \approx \sqrt{228.923} \approx 15$.

7. $c^2 = 10^2 + 18^2 - 2 \cdot 10 \cdot 18 \cdot \cos 120° = 100 + 324 - 360 \cos 120° = 604$ and so $c \approx \sqrt{604} \approx 24.576$. Then $\sin A \approx \dfrac{18 \cdot \sin 120°}{24.576} \approx 0.634295 \quad \Leftrightarrow$ $\angle A \approx \sin^{-1} 0.634295 \approx 39.4°$, and $\angle B \approx 180° - 120° - 39.4° = 20.6°$.