

(Old Book)

p. 213 Exercise 10D

3. a.  $\sin \theta = \frac{5}{6}$

$$\sin^{-1}(\sin \theta) = \sin^{-1}\left(\frac{5}{6}\right)$$
$$\theta = 56.4^\circ$$

b.  $\tan \alpha = \frac{1}{12}$

$$\tan^{-1}(\tan \alpha) = \tan^{-1}\left(\frac{1}{12}\right)$$
$$\alpha = 4.76^\circ$$

c.  $\cos \beta = \frac{4}{6}$

$$\cos^{-1}(\cos \beta) = \cos^{-1}\left(\frac{4}{6}\right)$$
$$\beta = 48.2^\circ$$

5. a.  $3^2 + x^2 = 4^2$   
 $x^2 = 7$   
 $x = \sqrt{7}$

$$\tan \theta = \frac{2}{\sqrt{7}}$$

$$\tan^{-1}(\tan \theta) = \tan^{-1}\left(\frac{2}{\sqrt{7}}\right)$$
$$\theta = 37.1^\circ$$

b.  $\sin 38^\circ = \frac{x}{10}$

$$\sin \theta = \frac{6.16}{8}$$

$$10 \sin 38^\circ = x$$
$$6.16 = x$$

$$\sin^{-1}(\sin \theta) = \sin^{-1}\left(\frac{6.16}{8}\right)$$
$$\theta = 50.3^\circ$$

I split  $y$  into 2 pieces, ~~3~~ solved for each, then added them together.

$$y = 10 \cos 38^\circ + 8 \cos 50.3^\circ = 13$$

p. 243 Exercise 12C

$$2. \quad 13^2 = 11^2 + 12^2 - 2(11)(12)\cos C$$

$$169 = 265 - 264\cos C$$

$$-96 = -264\cos C$$

$$\frac{-96}{-264} = \cos C$$

$$-264$$

$$C = 68.7^\circ$$

$$12^2 = 11^2 + 13^2 - 2(11)(13)\cos B$$

$$144 = 290 - 286\cos B$$

$$-146 = -286\cos B$$

$$\frac{-146}{-286} = \cos B$$

$$-286$$

$$B = 59.3^\circ$$

$$A + 68.7^\circ + 59.3^\circ = 180$$

$$A = 52^\circ$$

$$3. \quad 10^2 = 5^2 + 7^2 - 2(5)(7)\cos Q$$

$$100 = 74 - 70\cos Q$$

$$26 = -70\cos Q$$

$$\frac{26}{-70} = \cos Q$$

$$-70$$

$$Q = 112^\circ$$

$$4. \quad a. \quad 11^2 = 13^2 + 17^2 - 2(13)(17)\cos \theta$$

$$121 = 458 - 442\cos \theta$$

$$-337 = -442\cos \theta$$

$$\frac{-337}{-442} = \cos \theta$$

$$-442$$

$$\theta = 40.3^\circ$$

$$b. \quad 9^2 = 4^2 + 7^2 - 2(4)(7)\cos \beta$$

$$81 = 65 - 56\cos \beta$$

$$16 = -56\cos \beta$$

$$\frac{16}{-56} = \cos \beta$$

$$-56$$

$$\beta = 107^\circ$$



$$5. \quad a. \quad 4^2 = 2^2 + 5^2 - 2(2)(5)\cos\theta$$

$$16 = 29 - 20\cos\theta$$

$$-13 = -20\cos\theta$$

$$\frac{+13}{+20} = \cos\theta$$

$$+20$$

$$\text{or } .65 = \cos\theta$$

b. (use the bigger/outer triangle)

$$x^2 = 5^2 + 3^2 - 2(5)(3)\cos\theta$$

↑ use the value from part a.

$$x^2 = 5^2 + 3^2 - 2(5)(3)(.65)$$

$$x^2 = 14.5$$

$$x = 3.81$$