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5-8

1. a) 10.9 b) 8.5 c) 4.34

2. a) 104.5° b) 65° c) 117°

$$8^2 = 4^2 + 6^2 - 2(4)(6)\cos A$$

$$64 = 16 + 36 - 48\cos A$$

$$64 = 52 - 48\cos A$$

$$-52 \quad -52$$

$$\frac{12}{-48} = \frac{-48\cos A}{-48}$$

$$-0.25 = \cos A$$

$$\cos^{-1}(-0.25) = A$$

$$A = 104.5^\circ$$

3. sine law then cosine law

6.1 cm

4. 125.7°

$$5. \quad \frac{12}{\sin 60^\circ} = \frac{\overline{AM}}{\sin 52^\circ}$$

$$\overline{AM} = 10.9 \text{ cm}$$

$$\overline{BM} = \overline{MC}$$

$$= 12.8 \text{ cm}$$

$$m\angle A = 180^\circ - (60^\circ + 52^\circ)$$

$$= 68^\circ$$

$$\frac{\overline{MC}}{\sin 68^\circ} = \frac{12}{\sin 60^\circ}$$

$$\overline{MC} = 12.8 \text{ cm}$$

$$x^2 = 10.9^2 + 12.8^2 - 2(10.9)(12.8)\cos 120^\circ$$

$$x^2 = 422.17$$

$$x = \sqrt{422.17} = 20.5 \text{ cm}$$

20.5 cm

6. 59.0 m

7. $m\angle ACD = 180^\circ - 65^\circ$
 $= 115^\circ$

$$x^2 = 8.4^2 + 3.5^2 - 2(8.4)(3.5)\cos 115^\circ$$

$$= 107.7$$

$$x = \sqrt{107.7} \approx 10.4 \text{ cm}$$

8. $m\bar{AC}^2 = 3.2^2 + 5^2 - 2(3.2)(5)\cos 68^\circ$
 $m\bar{AC} = 4.8 \text{ cm}$

$$7.8^2 = 4.8^2 + 6.4^2 - 2(4.8)(6.4)\cos A$$

$$60.84 = 23.04 + 40.96 - 61.44\cos A$$

$$60.84 = 64 - 61.44\cos A$$

$$-3.16 = -61.44\cos A$$

$$0.05 = \cos A$$

$$A = \cos^{-1}(0.05)$$

$$A = 87^\circ$$