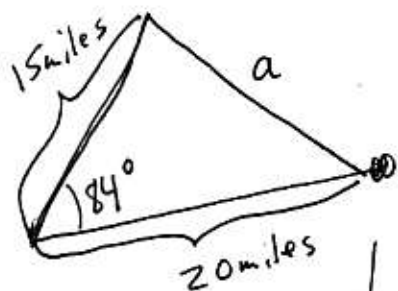


HW 18 Solution
Math 143

Section 8.2

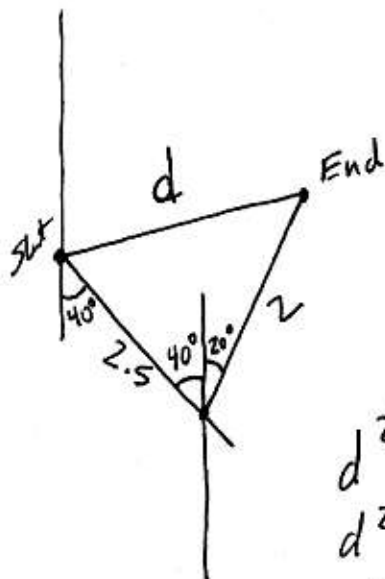
(17)



$$a^2 = 15^2 + 20^2 - 2(15)(20)\cos 84^\circ$$
$$a^2 = 562.283$$
$$a \approx 24 \text{ miles}$$

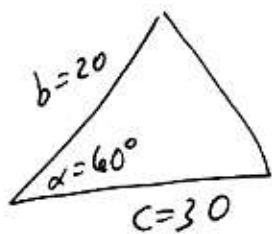
They are about 24 miles apart.

(21)



$$d^2 = 2.5^2 + 2^2 - 2(2.5)(2)\cos 40^\circ$$
$$d^2 = 6.25 + 4 - 5$$
$$d^2 = 5.25$$
$$d \approx 2.3 \text{ miles.}$$

33) $\alpha = 60^\circ, b = 20, c = 30$

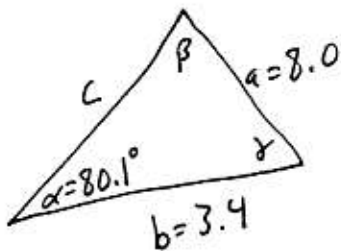


$$A = \frac{1}{2} bc \sin \alpha$$

$$A = \frac{1}{2} (20)(30) \sin(60^\circ)$$

$$A \approx 259.8$$

37) $\alpha = 80.1^\circ, a = 8.0, b = 3.4$



Find β first

$$\frac{\sin \beta}{3.4} = \frac{\sin(80.1^\circ)}{8.0}$$

$$\sin \beta = \frac{3.4 \sin(80.1^\circ)}{8.0}$$

$$\sin \beta \approx 0.41867$$

$$\beta \approx 24.8^\circ$$

$$\text{So } \gamma = 180^\circ - 80.1^\circ - 24.8^\circ = 75.1^\circ$$

$$A = \frac{1}{2} ab \sin \gamma = \frac{1}{2} (8.0)(3.4) \sin(75.1^\circ)$$

$$A \approx 13.14$$

Section 24

3) $(7-6i) - (-11-3i)$

$$= 7 - 6i + 11 + 3i$$

$$= 18 - 3i$$

7) $(1-3i)(2+5i)$

$$= 2 - 6i + 5i - 15i^2$$

$$= 2 - i + 15$$

$$= 17 - i$$

11) $i(3+4i)^2 = i(9 + 24i + 16i^2)$

$$= i(9 + 24i - 16)$$

$$= i(-7 + 24i)$$

$$= -7i + 24i^2$$

$$= -24 - 7i$$

$$(19) \frac{3}{2+4i} \cdot \frac{2-4i}{2-4i} = \frac{6-12i}{4-16i^2} = \frac{6-12i}{4+16} = \frac{6-12i}{20} = \frac{3}{10} - \frac{3}{5}i$$

$$(23) \frac{-4+6i}{2+7i} \cdot \frac{2-7i}{2-7i} = \frac{-8+28i+12i-42i^2}{4-49i^2} = \frac{-8+40i+42}{4+49} \\ = \frac{34+40i}{53} \\ = \frac{34}{53} + \frac{40}{53}i$$

$$(37) (2x-y) - 16i = 10 + 4yi$$

$$2x - y = 10 \quad -16 = 4y$$

$$-4 = y$$

$$2x - (-4) = 10$$

$$2x + 4 = 10$$

$$2x = 6$$

$$x = 3.$$