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Answers to Odd-Numbered
Chapter Problems

Chapters 2-11

Chapter 2

- 2-1. a. 35.33° b. 129.5875°
- 2-3. a. $45^\circ 45'$ b. $123^\circ 07' 24''$
- 2-5. $25^\circ 35' + 45^\circ 40' = 71^\circ 15'$
 $137^\circ 32' - 85^\circ 56' = 51^\circ 36'$
- 2-7. a. $35.33^\circ \times (1^\circ / 0.9^\circ) = 39.26^\circ$
b. $129.5875^\circ \times (1^\circ / 0.9^\circ) = 143.9861^\circ$
- 2-9. a. $75^\circ \times (0.9^\circ / 1^\circ) = 67.5^\circ$
b. $125.75^\circ \times (0.9^\circ / 1^\circ) = 113.18^\circ$
c. $200.4575^\circ \times (0.9^\circ / 1^\circ) = 180.4118^\circ$
- 2-11. a. $125.25 \text{ ft} \times (0.3048 \text{ m} / 1 \text{ ft}) = 38.18 \text{ m}$
b. $75.525 \text{ m} \times (1 \text{ ft} / 0.3048 \text{ m}) = 247.79 \text{ ft}$
c. $35 \text{ ch } 1 \text{ rd } 10 \text{ lk} = 36.35 \text{ ch} = 2333.10 \text{ ft}$
d. $2.75 \text{ mi} \times (1 \text{ km} / 0.621 \text{ mi}) = 4.43 \text{ km}$
- 2-13. a. $100\,500 \text{ ft}^2 \times (1 \text{ ac} / 43\,680 \text{ ft}^2) = 2.296 \text{ ac}$
b. $6.75 \text{ ac} \times (1 \text{ ha} / 2.471 \text{ ac}) = 2.33 \text{ ha}$
c. $6.75 \text{ ha} \times (2.471 \text{ ac} / 1 \text{ ha}) = 14.2 \text{ ac}$
d. $1000 \text{ ac} \times (1 \text{ mi}^2 / 640 \text{ ac}) = 1.563 \text{ mi}^2$ (assuming 1000. ac)
e. $3.5 \text{ mi}^2 \times (1 \text{ km}^2 / 0.3861 \text{ mi}^2) = 9.1 \text{ km}^2$
- 2-15. a. $270 \text{ ft}^3 \times (1 \text{ yd}^3 / 27 \text{ ft}^3) = 10 \text{ yd}^3$
b. $100 \text{ yd}^3 \times (1 \text{ m}^3 / 1.30795 \text{ yd}^3) = 76.5 \text{ m}^3$
- 2-17. a. 3 b. 6 c. 5 d. 3 e. 4
f. 3 g. 2 h. 2 i. 3 j. 3
- 2-19. 184.6
- 2-21. 5.26
- 2-23. 358; 0.975; 14 700; 34.6; 10.1
- 2-25. Average – 246.48 ft; $E_{95} - 1.96 \times \frac{\sqrt{0.0477}}{30} = \pm 0.078 \text{ ft}$.
- 2.27. $E = 0.078 \times \sqrt{2} = 0.110 \text{ ft}$.
- 2-29. Relative accuracy = 1:4900
- 2-31. Error of closure = $0.07 \times \sqrt{4} = 0/14 \text{ ft}$.
- 2-33. 1:2300; 1: 600
1:11 000; 1: 11 000
1:25 000; 1: 10 000

CHAPTER 3

3-1. a. $x = 3$ b. $t = -2$ c. $y = 3/2$ d. $n = 1/2$ e. $x = 4/17$

3.3. a. $x = \pm 5$ b. $x = -5, x - 2$ c. $x = -1, x = -2/3$
d. $x = 9.902, x = -0.277$ e. $y = 0.2434, y = -1.6434$

3.5 a. $x - 3, y = -1$ b. $x = 1.4545, y = 0.1818$ c. $x = -1, y - 3$

3-7. a. 198m^2 b. 450ft^2 c. 338m^2
d. 6760ft^2 e. 2886m^2 f. $30\,510\text{ft}^2$

3-9. a. opp = 259.55 ft, adj = 307.46 ft, $B = 49^\circ 49' 47''$
b. opp = 299.52m, adj = 158.22m, $B = 27^\circ 50' 45''$
c. hyp = 447.60 ft, opp = 265.42 ft, $B = 53^\circ 37' 50''$
d. $A = 67^\circ 59' 05''$, $B = 22^\circ 00' 55''$, adj = 160.55 m
e. $A = 47^\circ 49' 24''$, $B = 42^\circ 10' 36''$, opp = 303.33 ft
f. $A = 53^\circ 42' 07''$, $B = 36^\circ 17' 53''$, hyp = 466.31 m

- 3-11. a. $C = 57^{\circ}48'43''$, $a = 479.88$ ft, $c = 453.85$ ft
 b. $C = 120^{\circ}03'21''$, $a = 186.65$ m, $b = 215.05$ m
 c. $B = 61^{\circ}20'38''$, $C = 83^{\circ}17'28''$, $c = 541.30$ ft
 d. $B = 48^{\circ}18'44''$, $C = 67^{\circ}14'03''$, $c = 365.33$ m
 e. $B = 73^{\circ}32'13''$, $C = 55^{\circ}17'34''$, $a = 290.93$ ft
 f. $B = 87^{\circ}41'36''$, $C = 30^{\circ}27'55''$, $a = 398.50$ m
 g. $A = 35^{\circ}12'48''$, $B = 46^{\circ}20'06''$, $C = 98^{\circ}27'06''$
- 3-13. Building height = 20.98
- 3-15. $73^{\circ}18'03''$; $106^{\circ}41'57''$; 104.40 m
- 3-17. Base = 50.38 ft
- 3-19. $AB = 422.62$ ft; $BC = 875.94$ ft; $CD = 1032.89$ ft
- 3-21. $30^{\circ}06'30''$; $122^{\circ}02'68''$; $27^{\circ}50'32''$
- 3-23. $XY = 205$ m
- 3-25. $AB = 415.66$ ft.
- 3-27. a. $\tan 30 = 0.5774$
 $\sin 30/\cos 30 = 0.500/0.866 = 0.5774$
 b. $\sin^2 30 + \cos^2 30 = 0.5^2 + 0.866^2 = 0.25 + 0.75 = 1$
 c. $\sin (2 \times 30) = \sin 60 = 0.866$
 $2 \times \sin 30 \times \cos 30 = 2 \times 0.5 \times 0.866 = 0.866$
 d. $\tan (30/2) = \tan 15 = 0.268$
 $(1 - \cos 30)/\sin 30 = 0.268$
- 3-29. $CD = \sqrt{45^2 + 60^2} = 75$
- 3-31. $y = 2x + 20$
- 3-33. $4x - 3y = 30$
- 3-35. Intersection point: (4, 4)
- 3-37. $x^2 + y^2 = 25$
- 3-39. $x^2 + y^2 = 25$
 $2x^2 = 25$
 $x^2 = 12.5$
 $x = \pm 3.5355$
 Intersection points: (3.5355, 3.5355) and (-3.5355, 3.5355)