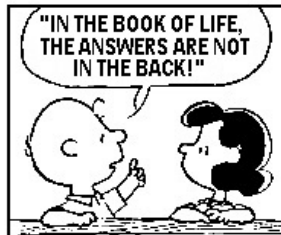


Answer Key



UNIT 1: NUMBER SENSE

1-1 Number Systems

1a. 2,3,4,5,6,8,10 b. none c. 3,5,9 d. 2,3,4,6,8 2. 2,8 3. 1 4. 6 5. 360

6a. F b. T c. T d. T e. F f. F g. T

1-2 Divisibility Rules

1a. 2,3,4,5,6,8,10 b. none c. 3,5,9 d. 2,3,4,6,8 2. 2,8 3. 1 4. 6 5. 360

6a. F b. T c. T d. T e. F f. F g. T

1-3 Factors and Multiples

1a. 1,3,5,15 b. 1,2,4,7,14,28 c. 1,2,3,6,7,14,21,42 d. 1,2,3,6,13,26,39,78

e. 1,3,7,9,21,63 f. 1,2,3,4,5,6,8,10,12,15,20,24,30,40,60,120

2. Common factors: 1,2,3,4,6,12

3a. 2,4,6,8,10,12,14,16,18,20 b. 3,6,9,12,15,18,21,24,27,30

c. 6,12,18,24,30,36,42,48,54,60 d. 9,18,27,36,45,54,63,72,81,90

e. 12,24,36,48,60,72,84,96,108,120 f. 18,36,54,72,90,108,126,144,162,180

4. 36,72,108 5a. 98 b. 196 c. 497 d. 994 6. 84

1-4 Prime and Composite Numbers

1. neither 2. no 3a. F b. F c. F d. T e. F f. T

4a. ST b. NT c. ST d. AT 5. answers may vary 6. answers may vary

1-5 Prime Factorization

1a. 2×5 b. 2×7 c. 31 d. $2^2 \times 3^2$ e. $2^4 \times 5$ f. $2^4 \times 3$ g. $2^3 \times 3^2$

h. 2^8 i. $2^2 \times 31$ j. $3 \times 5 \times 7$ k. $3 \times 11 \times 13$ l. $5 \times 7 \times 13$ m. $2^2 \times 3 \times 7 \times 13$

n. $2^2 \times 3^2 \times 7$ o. $2^4 \times 3^4$

2. answers may vary

1-6 GCF and LCM

I

1a. 2 b. 6 c. 15 d. 1 e. 6 f. 7 g. 24 h. 12 i. 72 j. 4 k. $2^2 \times 3^2 \times 5 \times 7$

2. 12, 60 3. 6, 18, 30, 42, 54 4. none 5. yes

II

1a. 20 b. 350 c. 36 d. 80 e. 126 f. 216 g. 3600 h. 48 i. 1440

j. $2^3 \times 3^4 \times 5^3 \times 7^2 \times 11$ 2. 36 3. 18, 24, 72 4. answers may vary 5. answers may vary

1-7 Add/Sub Integers

I

1. 5 2. 8 3. 7 4. -10 5. -6 6. -14 7. -5 8. -36 9. -4 10. 11 11. -5 12. 2
13. -10 14. -30 15. 12 16. -12 17. pos 18. dep 19. dep 20. neg 21. answers may vary

II

1. 9 2. -24 3. 7 4. -6 5. -6 6. 0 7. -9 8. 36 9. -4 10. -10 11. 23 12. -1
13. -10 14. 6 15. 6 16. -7 17. 11 18. 15 19. dep 20. pos 21. neg 22. dep
23. answers may vary 24. answers may vary

1-8 Integers: Multiplication and Division

1. 56 2. -54 3. -60 4. 32 5. 45 6. -68 7. 104
8. -84 9. -300 10. 60 11. -7 12. -3 13. 8 14. -16 15. -8
16. 15 17. -16 18. -6 19. -4 20. -5 21. 9
22. 12 23. -42 24. -9

Order of Operations

1. 3 2. 6 3. -4 4. -6 5. -36 6. -11 7. 13 8. -16
9. -2 10. -7 11. -72 12. 64 13. 40 14. -16 15. -4 16. 18
17. 12 18. 9 19. 27 20. 20 21. -13 22. 79

1-9 Zero and One

1. 0 2. 0 3. 0 4. 0 5. 1 6. 0 7. 1 8. 0 9. 6 10. 1
11. 6 12. 6 13. 1 14. 49 15. 49 16. undefined 17. r 18. 1 19. 0 20. r
21. b 22. y 23. c 24. f 25. n 26. 0 27. 0
28. undefined 29. 0 30. 0 31. 1 32. 36 33. 0 34. -4 35. -4
36. 0 37. 0 38. undefined 39. -4 40. 12 41. answers may vary
42. neither

UNIT 2: RATIONAL NUMBERS

2-1 Fractions and Mixed Numbers



3. 38 4a. $\frac{35}{8}$ b. $\frac{23}{3}$ c. $\frac{58}{9}$ d. $\frac{80}{7}$ 5a. $3\frac{3}{4}$ b. $3\frac{1}{7}$ c. $11\frac{7}{8}$ d. $8\frac{5}{6}$
- 6a. $5\frac{1}{4}$ b. $6\frac{1}{2}$ c. $11\frac{4}{7}$ d. 4
- 7a. $\frac{3}{4}$ b. $\frac{3}{5}$ c. $\frac{2}{3}$ d. $\frac{16}{3}$ e. $\frac{16}{3}$ f. $\frac{14}{15}$ g. $\frac{13}{20}$ h. $\frac{2}{3}$ i. $\frac{3}{4}$ j. $\frac{7}{9}$
- 8a. 9 b. 20 c. 40 d. 56 e. 8 f. 35 g. 24 h. 54

2-2 Adding/Subtracting Fractions

1. $\frac{5}{7}$ 2. $\frac{3}{5}$ 3. $\frac{4}{5}$ 4. $\frac{13}{14}$ 5. $\frac{29}{24}$ 6. $\frac{23}{50}$ 7. $\frac{29}{36}$ 8. $\frac{61}{126}$ 9. $\frac{115}{21}$
10. 10 11. $\frac{215}{28}$ 12. $\frac{3}{2}$ 13. $\frac{41}{24}$ 14. $\frac{3}{7}$ 15. $\frac{4}{5}$ 16. $-\frac{1}{4}$ 17. $\frac{1}{8}$ 18. $\frac{11}{24}$
19. $-\frac{19}{24}$ 20. $-\frac{1}{72}$ 21. $\frac{13}{63}$ 22. $\frac{7}{10}$ 23. $\frac{21}{8}$ 24. $\frac{39}{20}$ 25. $-\frac{25}{28}$ 26. $\frac{61}{8}$ 27. $\frac{27}{56}$
28. $\frac{23}{60}$ 29. $\frac{8}{3}$

2-3 Multiplying Fractions

1. 3 2. $\frac{5}{2}$ 3. 9 4. $\frac{10}{21}$ 5. $\frac{5}{16}$ 6. $\frac{4}{7}$ 7. $\frac{1}{18}$ 8. $\frac{1}{27}$ 9. $-\frac{10}{49}$ 10. $\frac{21}{2}$ 11. $\frac{5}{7}$
12. $\frac{3}{8}$ 13. $\frac{4}{3}$ 14. 7 15. $-\frac{1}{3}$ 16. $\frac{35}{64}$ 17. $-\frac{2}{3}$ 18. $\frac{7}{12}$ 19. $\frac{41}{8}$ 20. 0
21. answers may vary 22. 52

2-4 Dividing Fractions

- 1a. $\frac{1}{5}$ b. 3 c. $\frac{3}{2}$ d. $\frac{5}{13}$ e. $-\frac{2}{5}$ f. $-\frac{7}{25}$
2. 9 3. $\frac{5}{2}$ 4. $\frac{3}{8}$ 5. $\frac{15}{14}$ 6. $\frac{20}{9}$ 7. $\frac{9}{8}$ 8. $\frac{15}{16}$ 9. $\frac{7}{27}$
10. $-\frac{20}{21}$ 11. $\frac{1}{4}$ 12. $\frac{14}{5}$ 13. $\frac{3}{8}$ 14. $\frac{11}{12}$ 15. $\frac{11}{10}$ 16. -15
- 17a. $4\frac{1}{2}$ cups flour, 4 cups sugar. b. 12 c. $\frac{1}{3}$ cups more sugar, $1\frac{1}{12}$ cups flour, 5 batches

2.5 Fractions <--> Decimals

1.

1/3	0. $\overline{3}$
2/3	0. $\overline{6}$

1/4	0.25
2/4	0.5
3/4	0.75

1/5	0.2
2/5	0.4
3/5	0.6
4/5	0.8

1/6	0. $\overline{16}$
2/6	0. $\overline{3}$
3/6	0.5
4/6	0. $\overline{6}$
5/6	0. $\overline{83}$

1/8	0.125
2/8	0.25
3/8	0.375
4/8	0.5
5/8	0.625
6/8	0.75
7/8	0.875

1/9	0. $\overline{1}$
2/9	0. $\overline{2}$
3/9	0. $\overline{3}$
4/9	0. $\overline{4}$
5/9	0. $\overline{5}$
6/9	0. $\overline{6}$
7/9	0. $\overline{7}$
8/9	0. $\overline{8}$

2a. $\frac{3}{20}$ b. $\frac{9}{25}$ c. $\frac{12}{25}$ d. $\frac{6}{5}$ e. $\frac{31}{25}$ f. $\frac{33}{5}$ g. $\frac{9}{40}$ h. $\frac{2}{25}$ i. $\frac{24}{25}$ j. $\frac{9}{4}$

3a. 1.5 b. 0.19 c. 0.42 d. 1.75 e. 1.6 f. 0.58 g. $1.8\overline{3}$ h. 0.36 i. 0.2
 j. 0.65 k. $4.\overline{3}$ l. 3.14

2.6 Multiplying and Dividing with Powers of 10

1a. 530, 5 300, 53 000 b. 0.8, 8, 80 c. 17.5, 175, 1 750

d. 4 316, 43 160, 431 600 e. 0.006, 0.06, 0.6

2a. 5.3, 0.53, 0.053 b. 0.008, 0.000 8, 0.000 08 c. 0.175, 0.017 5, 0.001 75

d. 43.16, 4.316, 0.431 6, e. 0.000 06, 0.000 006, 0.000 000 6

3. equivalent to #1 4. equivalent to #2

5a. 10 b. 0.031 5 c. 0.002 52 d. 0.014 4 e. 0.499 95 f. 13.75 g. 0.000 01

h. 960 000 i. 52 500 000 j. 4.521 6 k. 281 600 l. 1 812.5

6a. 0.03 b. 0.06 c. 0.125 d. 0.016 e. 0.000 25 f. 0.001 5 g. 150 h. 43

i. 1 550 j. 7 k. 2.27 l. 0.121

2.7 Operations with Decimals

1a. 12 b. -5 c. -8 d. -36 e. 8 f. $-\frac{1}{2}$

2a. 11.2 b. 17.37 c. 4.41 d. -2.7 e. 7.54 f. -7.19 g. 2.75 h. -1.8 i. 10.58

j. -19.494 k. 36.984 l. 9.6 m. 3.31 n. 8.44 o. 51.5 p. -9.14 q. 20.12 r. -1.9

s. 170.75

UNIT 3: RATIO, RATE & PERCENT

3-1 Ratios and Proportions

- 1a. 18:12, 3:2 b. 12:30, 2:5 c. 30:12:18, 5:2:3
2a. 26:26, 1:1 b. 13:26, 1:2 c. 4:52, 1:13 d. 13:39, 1:3 e. 12:13 f. 52:12, 13:3
3a. 3:10 b. 200:7 c. 3:50 d. 2:10,000 e. 3:8 f. 2:3
4a. 16 b. 2 c. 8, 42 d. 30 e. 21.6 f. 13, 36
5a. 18 b. 15 c. 90 d. 49.5 e. 16 f. 20 g. 1.25 h. 40 i. 4 j. 1.5 k. 5.25 l. 28
6a. 29.75 b. 16.42 c. 155.17 d. 527.47 7. 250
8. 18cm by 24cm 9. 600 10a. 210 b. 25 c. 60 11. 6m by 9m 12. 1:250 13. 625g
14. Canada 48, USA 24, Russia 32

3-2 Rates

- 1a. \$0.90/L b. \$0.25/each c. \$0.75/can d. \$1.40/L e. $1.\bar{3}$ km/min f. 6 km/hr
g. \$1500/L or \$1.50/mL h. \$17.5/L i. \$500/kg or \$0.50/g j. 90 km/hr
2a. \$2.40 per 100g b. \$6 c. \$24/kg d. 1.5kg 3a. \$11.20 b. 17
4a. 120km/hr b. 720km c. 19 hr 5a. Cid b. 2 hours 6. 8L per 100km 7. 125m/sec
8. 2 min 9. 2hr 8min 10a. dozen for \$7.99 b. \$1.75 fo 350ml c. \$16 for 750g
d. same e. one year membership f. \$5 for 800g 11. \$53.33

3-3 Percents

1. answers may vary
2a. 40% b. 23% c. 6% d. 0.5% e. 120% f. 200% g. 42.5% h. 107%
3a. 0.25 b. 0.04 c. 0.7 d. 1.1 e. 0.003 f. 0.045 g. 3.5 h. 0.0875
4a. 60% b. 70% c. 46% d. 12.5% e. 3.2% f. 100% g. 62.5% h. 75%
i. $84.\bar{4}$ % j. 80% k. $33.\bar{3}$ %
5a. $\frac{3}{50}$ b. $\frac{3}{20}$ c. $\frac{1}{250}$ d. $\frac{7}{20}$ e. $\frac{4}{5}$ f. $\frac{11}{10}$ g. $\frac{17}{200}$ h. $\frac{9}{125}$
6a. 75% b. 75% c. 67% d. 33% e. 80% f. 50% g. 100% h. 25%
7. 25% 8. 12.5% 9. $8.\bar{3}$ % 10. 40% 11. 70%, 69 12a. 8% b. 20% c. 13.6%

13.

Percent	Decimal	Fraction	Ratio
50%	0.5	$\frac{1}{2}$	1:2
25%	0.25	$\frac{1}{4}$	1:4
60%	0.6	$\frac{3}{5}$	3:5
75%	0.75	$\frac{3}{4}$	12:16
82%	0.82	$\frac{41}{50}$	41:50
120%	1.2	$\frac{6}{5}$	6:5
7.5%	0.075	$\frac{3}{40}$	3:40
$66.\bar{6}\%$	$0.\bar{6}$	$\frac{2}{3}$	2:3
62.5%	0.625	$\frac{5}{8}$	5:8
0.4%	0.004	$\frac{1}{250}$	1:250

3-4 Percent of a Number

- 1a. \$5.80 or \$6 b. 5, 5.20 or 6 c. \$9 d. \$21
 2a. \$6 b. \$3 c. \$13.50 or \$15 d. \$24
 3a. 2 - 4, 2.4 b. 3 - 6, 4.8 c. 0 - 14, 11.2 d. 36 - 48, 38.4
 e. 36 - 42, 40 f. 168 - 189, 183.75
 4a. 12.2 b. 250 c. 1.6 d. 2.55 e. 28 f. 45
 5. \$2400 6. 47 or 48 7. 120% 8. save \$32, sale price \$128, one-step \$160 × 0.8
 9. year 1: \$15600, year 2: \$16224 10. 64 11. more, its 125%
 12. Paul 75%, Mary 16 out of 20 13. 6%

3-5 Applications of Percents

- 1a. tax \$36, total \$336, one-step: 300×1.12 b. tax \$15, total \$315
 c. discount \$60, sale price \$240, total \$268.80 d. 1 and 2 are equal and cheaper than 3
 2. 45% 3. 15 4a. \$54 b. 10% is calculated on a lower amount c. 32.5%
 5a. interest \$400, total \$1400 b. interest \$180, total \$680 6. 5 years 7. 12 years
 8. \$2500 9. \$370 10. \$200 11a. > \$5000 b. answers may vary

3-6 100% of a number

- 1a. 120 b. 24 c. 70 d. 60 e. 288 f. 800 g. 30 h. 800 i. 250 2. \$80 3. \$30
4. \$20 5. \$1250 6. \$85 7. \$800, HST \$96 8. \$320 9. 350 10. 135 11. $16\frac{2}{3}$ cups,

UNIT 4: ALGEBRA

4-1 Evaluating Expressions

- 1a. 1 b. -23 c. 19 d. -9 e. 16 f. 23 g. 8 h. -10 i. 11 j. $\frac{25}{28}$ k. $\frac{4}{3}$ l. -2 m. 37 n.
-1 o. -12
2.

y	5	3	8	4.5	1	12	-6	-2.5
x	0	2	-3	0.5	4	-7	11	7.5

- 3a. 86°F b. 50°F 4a. 180m b. between 6 and 7 seconds
5a. True b. False c. True d. True e. True f. False g. False h. False
6a. 1st - Netherlands 9pts, 2nd - Italy 6 pts, 3rd - Turkey 5 pts, 4th - Romania 0 pts
b. $P = 3W + T$ c. 4, 6, 8, 10 or 12 pts d. Turkey and Italy would tie for 2nd with 4 pts points.

4-2 Like Terms and the Distributive Property

- 1a. $7x$ b. $9w$ c. -6ϕ d. $-5x^2$ e. $4x + 12$ f. $7y - 5q$ g. $2y$ h. $-4a + 13$ i. $11d + 5$
j. $12a^2 - 3a$ k. $-15b - 13a + c^2 + c$ l. $-\frac{1}{10}b + \frac{5}{4}c$
2a. $2x + 10$ b. $5k - 20$ c. $6n + 15$ d. $-12 + 24r$ e. $-3\Omega - 6$ f. $-4m + 12$ g. $-x - 2y$
h. $-x + 3y$ i. $-5x + 10y - 15z$
3a. $5x - 2$ b. $17a + 4b$ c. $-2b$ d. $3x - 41$ e. $-5x + 10$ f. $2m + 15n$ g. $6x - 3$
h. $-6x - 1$ i. $14x - 8$ j. $6x + 9$ k. $7x + 1$ l. $\frac{7}{6}n + \frac{1}{6}$
4a. 380 b. 224 c. 104 d. 198

4-3 Writing Expressions and Equations

- 1a. $n + 5 = 12$ b. $n - 7 = 8$ c. $n + 6 = 11$ d. $8 - n = -4$ e. $12 - n = 2$ f. $2n - 3 = 7$

g. $2(n + 4) = 20$ h. $4n + 3 = 17$ i. $n(n + 4) = 42$ j. $\frac{1}{3}n - 2 = 4$

2a. \$7 b. \$15.50 c. \$5.13 d. \$20 - x 3. 44 - n

4.	Age now	Age in 7 years	Age 4 years ago
Brad		52	41
Angelina	33		29
George	47	54	
Britney		$n + 7$	$n - 4$
Miley	$x - 7$		$x - 11$
Hannah	$a + 4$	$a + 11$	

5. $3(2n + 5) = 57$

6.	# of coins	Value (cents)
Nickels		35
Dimes	7	
Quarters	11	275
Total		380
	# of coins	Value (cents)
Nickels		$5n$
Dimes		$10d$
Quarters		$25q$
Total	$n + d + q$	$5n + 10d + 25q$

7a. $n + 1, n + 2$ b. $n - 1, n + 1$ 8a. $n + 2, n + 4$ b. $n - 2, n + 2$

9a. 34cm b. $2b + 2h$ c. $2h + 3, 6h + 6$

4-4 Solving One and Two Step Equations

1a. $x = 12$ b. $n = 17$ c. $x = -9$ d. $m = -9$ e. $p = \frac{3}{5}$ f. $d = \frac{1}{12}$ g. $b = 12$

h. $f = -8$ i. $n = -9$ j. $v = 9$ k. $x = 18$ l. $n = -28$ m. $n = 12$ n. $x = \frac{10}{7}$

o. $x = -20$ p. $n = 50$ q. $x = -16$ r. $y = 0$

2a. yes b. yes c. no d. no e. no f. yes

3a. $x = 15$ b. $n = \frac{26}{3}$ c. $-4 = a$ d. $h = -6$ e. $x = -4$ f. $x = -7$ g. $x = 12$

h. $x = 12$ i. $-12 = x$ j. $d = 18$ k. $r = -24$ l. $-36 = b$ m. $x = 28$ n. $c = 18$

o. $75 = x$ p. $x = 2$ q. $x = 0$

4-5 Multi-Step Equations

1. $x = 10$ 2. $n = 2$ 3. $z = 60$ 4. $y = -20$ 5. $p = 2$ 6. $x = 8$ 7. $-8 = x$ 8. $-2 = z$

9. $-3 = x$ 10. $3 = w$ 11. $x = -\frac{1}{6}$ 12. $m = \frac{11}{2}$ 13. $x = \frac{1}{10}$ 14. $20 = y$ 15. $x = \frac{6}{5}$
 16. $x = -3$ 17. $x = -2$ 18. $x = 3$ 19. no solution 20. $x = \text{any number}$ 21. $m = -\frac{19}{10}$
 22. $k = -3$ 23. $w = 4$ 24. $n = -2$ 25. $x = -\frac{5}{2}$ 26. $x = -4$ 27. $x = -2$

4-6 Problems

1. 8 2. 15 3. 5 4. 26 years old 5. -15 6. 117 7. 42,43,44 8. 71, 73, 75, 77
 9. Hillary 180, Obama 435 10. 57, 19 11. son 16, dad 64 12. 42ft by 51ft
 13. 12 dimes, 14 pennies, 9 nickels, \$1.79 14. 83 guests 15. 4 years old
 16. 41, 56, 82 17. 35cm,35cm,30cm 18. 12 dimes, 24 quarters, 20 nickels 19. 30
 20. answers may vary

		P o w e r									
		1	2	3	4	5	6	7	8	9	10
e s s e s	2	2	4	8	16	32	64	128	256	512	1 024
	3	3	9	27	81	243	729	2 187	6 561		
	4	4	16	64	256	1 024	4 096	16 384			
	5	5	25	125	625	3 125					
	6	6	36	216	1 296	7 776					
	7	7	49	343	2 401	16 807					
	8	8	64	512	4 096						
	9	9	81	729	6 561						
	10	10	100	1 000	10 000	100 000	1 000 000	10 000 000	100 000 000	1 000 000 000	10 000 000 000

UNIT 5: EXPONENTS AND SQUARE ROOTS

5-1 Exponents

I. 1. $(-2)(-2)(-2)(-2)(-2)(-2)(-2) = -128$ 2. $-(2)(2)(2)(2)(2)(2)(2) = -128$
 3. $(-3)(-3)(-3)(-3) = 81$ 4. $-(3)(3)(3)(3) = -81$ 5. $\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \left(\frac{1}{8}\right)$
 6. $\frac{(1)(1)(1)}{2} = \left(\frac{1}{2}\right)$ 7. $\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right) = \left(\frac{8}{27}\right)$ 8. $\frac{(2)(2)(2)}{3} = \left(\frac{8}{3}\right)$

$$9. \left(\frac{2}{(3)(3)(3)} \right) = \left(\frac{2}{27} \right)$$

$$10. \left(\frac{(2)(2)(2)}{(3)(3)(3)} \right) = \left(\frac{8}{27} \right)$$

II. 1. 8^3 2. 2^6 3. $(-2)^5$ 4. $-(10)^4$

III. 1. 49 2. 144 3. 81 4. 64 5. $\frac{4}{25}$ 6. $\frac{49}{16}$ 7. $\frac{1}{8}$

8. $\frac{1}{81}$ 9. 0.64 10. 1.44 11. 0.0169 12. 16 13. -16

14. -8 15. -8 16. -1 17. 1 18. 72 19. 40

20. -7 21. 1 22. 12 23. 144 24. 48 25. -48

26. 144 27. -144 28. 2 29. -2 30. -36

IV. 1. 16 2. 27 3. 144 4. -64 5. -343 6. 91

V. 1. They form the perfect squares. Answers may vary 2. 22 3. 7
4. 83 5. 77 6. 5

VI. 1. 2592 2. 3435 3. 666 4. 34 012 224 5. 1233 6. 64, 729

7. 225 625 1225 2025 3025 4225 5625 7225 9025 11025 13225...

5-2 Perfect Squares and Cubes

I. 1 4 9 16 25 36 49
64 81 100 121 144 169 196
225 256 289 324 361 400 441
484 529 576 625

II. 1 8 27 64 125 216 343
512 729 1000 1331 1728

III. Perfect squares: 1, 16, $1\frac{7}{9}$, 25, 0.64, $\frac{8}{18}$, 121, 1.44
Perfect cubes: 1, -1, 8, $\frac{27}{64}$, $\frac{8}{27}$, -27, 343000

IV. a. 10×10 b. 21×21 c. 15×15 d. 19×19
e. 23×23 f. 1700×1700 g. 5000×5000 h. 270×270
i. 3100×3100 j. 0.002×0.002

- V. a. $3 \times 3 \times 3$ b. $10 \times 10 \times 10$ c. $7 \times 7 \times 7$ d. $12 \times 12 \times 12$
 e. $15 \times 15 \times 15$ f. $-20 \times -20 \times -20$ g. $500 \times 500 \times 500$
 h. $60 \times 60 \times 60$ i. $4000 \times 4000 \times 4000$ j. $0.02 \times 0.02 \times 0.02$
- VI. a. $18 \times 2 = 36$ b. $12 \times 3 = 36$ c. $10 \times 4 = 400$ d. $\frac{2}{3} \times 6 = \frac{12}{3} = 4$
 e. $\frac{8}{5} \times \frac{2}{5} = \frac{16}{25}$ f. $\frac{1}{6} \times 150 = 25$ g. $\left(-\frac{5}{4}\right) \times \left(-\frac{16}{5}\right) = 4$ h. $\left(-\frac{11}{8}\right) \times \left(-\frac{2}{11}\right) = \frac{1}{4}$
- VII. a. $16 \times 4 = 64$ b. $32 \times 2 = 64$ c. $10 \times \frac{4}{5} = 8$ d. $\frac{49}{27} \times 7 = \frac{343}{27}$
 e. $\frac{8}{25} \times \frac{1}{5} = \frac{8}{125}$ f. $\frac{9}{16} \times \frac{3}{4} = \frac{27}{64}$ g. $\left(-\frac{5}{6}\right) \times 150 = -125$ h. $\left(-\frac{11}{8}\right) \times \frac{1}{11} = -\frac{1}{8}$

5-3 Exponent Laws

- I. 1. 9^8 2. 7^{12} 3. 4^{19} 4. x^{18} 5. w^{54} 6. $(-6)^9$ 7. 24^5
 8. 3^5 9. t^{22} 10. 5^0 11. 2^3 12. 8^8 13. 11^5
- II. 1. 1 2. 1 3. -1 4. 1 5. -8 6. 1 7. 4 8. -1
- III. 1. 2^6 2. 2^6 3. 7^6 4. $(-3)^{56}$ which equals 3^{56} 5. 12^{33}
 6. 2^6 7. n^{12} 8. n^{12} 9. x^{18} 10. $a^3b^3c^3$ 11. $81m^8$
 12. $32x^5y^5$ 13. 3^{45}
 14a. Yes, 3^5 b. No, 48 c. No, 54 d. Yes, $2^3, 8$ e. No, 216 f. Yes, 2^{36}

5-4 Roots

- I. 1. 5 4. 9 5. 13 7. 40 8. 30 9. $\frac{9}{20}$ 10. 0.8
- II. 1. 2 3. 4 6. 6 7. 10 10. 9 9. $\frac{3}{2}$
- III. 1. 7 2. 12 3. 9 4. 0.5 5. 0.3 6. 110
 7. 700 8. 0.12
 9. adding one more decimal place changes the question so that it is not a perfect square...
 10. 0.11 11. $\frac{2}{3}$ 12. $\frac{7}{3}$ 13. $\frac{5}{6}$ 14. ≈ 5.5
 15. ≈ 8.9 16. 649 17. $\frac{1}{2}$ 18. 12 19. 8
 20. not a real number 21. -8 22. 10 23. 4 24. ≈ 16.1 25. 12
 26. 8 27. 9 28. 20 29. 1 30. 5 31. $\sqrt{7} \approx 2.6$
 32. 12 33. $\frac{4}{3}$ 34. 7 35. 1 36. 12 37. $\frac{4}{3}$
- IV. 1. a,c,f,j have rational square roots; b,d,e,g,h,i have irrational square roots
- V. 1. negative numbers 2. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

3. 32cm 4. answers may vary 5. only zero and 1

6a. sometimes (eg $\sqrt{0.25} = 0.5 > 0.25$, but $\sqrt{9} = 3 < 9$) b. always

c. sometimes (eg $\sqrt{4} = \text{even}$, but $\sqrt{6}$ is not even) d. never

7. answers may vary $\sqrt[3]{8} = 2$ because $2^3 = 8$ 8. x^8 9. $\sqrt{x} = x^{\frac{1}{2}}$

5-5 The Pythagorean Theorem

1. some examples: {5, 12, 13} {8, 15, 17} {7, 24, 25} {9, 40, 41} {15, 112, 113}

2a. 5 b. 8 c. $\sqrt{74}$, ~8.6 d. 7 e. $\sqrt{95}$, ~9.7 f. $\sqrt{50}$, ~7.1

3a. $\sqrt{133}$, ~11.5 b. $\sqrt{27}$, ~5.2 c. 4 d. 6

4a. 8 cm b. $\sqrt{55}$, ~7.4m c. 30 m d. 500 m e. 54 f. 8 km 5a. no b. yes c. no

6. $\sqrt{74}$, $\sqrt{24}$

UNIT 6: GEOMETRY

6-1 Angles

1a. AFB, EFD, BFC b. EFB, DFC, DFA c. EFA, AFC d. EFC, DFB e. BFC or EFD

f. EFB or DFC g. DFA h. BFC i. EFA

2a. ROQ b. ROT c. TOP or QOS d. ROP e. TOP f. SOT g. ROP h. SOQ or POT
i. QOP or SOT j. ROT

3a. GJH & LJK, GJL & HJK b. GJL, HJK c. GJK, HJL d. HJK

4a. 58° b. 123° c. 60° d. 105° e. 106° f. $46^\circ, 134^\circ$ g. 78° h. $47^\circ, 65^\circ, 68^\circ, 68^\circ$

i. $30^\circ, 60^\circ, 120^\circ$ j. $90^\circ, 30^\circ, 60^\circ, 90^\circ, 60^\circ, 120^\circ, 150^\circ$ 5a. T b. T c. F d. T

6a. $45^\circ, 45^\circ$ b. $60^\circ, 30^\circ$ c. $55^\circ, 35^\circ$ d. $40^\circ, 50^\circ$

7a. $90^\circ, 90^\circ$ b. $120^\circ, 60^\circ$ c. $144^\circ, 36^\circ$ d. $67^\circ, 113^\circ$

6-2 Parallel Lines and Transversals

1a. 1 b. 1 c. 7 d. 3 e. 3 f. 3 g. 5 2a. 6 b. 5 c. 2 d. 2 e. 4

3a. $112^\circ, 112^\circ, 68^\circ$ b. $53^\circ, 127^\circ$ c. 112° d. 110° e. $125^\circ, 72^\circ, 72^\circ, 108^\circ$

f. $63^\circ, 63^\circ, 47^\circ, 133^\circ$ g. $40^\circ, 110^\circ, 70^\circ$ h. $35^\circ, 25^\circ$ i. $45^\circ, 95^\circ, 85^\circ, 40^\circ$

j. $75^\circ, 105^\circ, 14^\circ, 91^\circ$ k. $35^\circ, 125^\circ, 55^\circ, 50^\circ, 15^\circ$

4a. 12 b. 5, 11 c. 3, 9 d. 7, 13 e. 1, 7, 9, 14 f. 1, 3, 5, 9, 11, 13, 14

5a. C b. S c. V d. A e. C f. S g. I h. A i. I j. N

6a. $75^\circ, 75^\circ, 105^\circ, 25^\circ$ b. $70^\circ, 62^\circ, 70^\circ$ c. $35^\circ, 80^\circ, 100^\circ, 45^\circ, 45^\circ$

7a. a, b, c b. c, d, b c. a, b, d d. c, d, a

6-3 Triangles

1. 98° 2. 49° 3. $67^\circ, 46^\circ$ 4. $40^\circ, 40^\circ$ 5. 60° 6. $30^\circ, 95^\circ$ 7. $110^\circ, 24^\circ$
 8. $106^\circ, 37^\circ$ 9. $103^\circ, 77^\circ, 51.5^\circ$ 10. $60^\circ, 120^\circ, 35^\circ$ 11. $28^\circ, 28^\circ, 52^\circ$ 12. 45°
 13. $45^\circ, 45^\circ, 40^\circ$ 14. 33° 15. $53^\circ, 74^\circ$ 16. $115^\circ, 32.5^\circ$ 17. $130^\circ, 25^\circ$
 18. $20^\circ, 140^\circ, 40^\circ, 70^\circ$ 19. $117^\circ, 63^\circ, 27^\circ$ 20. $34^\circ, 90^\circ, 56^\circ$ 21. $105^\circ, 48^\circ$
 22. $40^\circ, 88^\circ, 52^\circ$ 23. $18^\circ, 18^\circ$ 24. $71^\circ, 38^\circ$ 25. $75^\circ, 70^\circ$ 26. 107° 27. 62°
 28. 119° 29. 100° 30. 30° 31. 22.5° 32. 30° 33. 65° 34. 92° 35. 70°
 36a. $A = 60^\circ, B = 30^\circ, C = 90^\circ$ b. $A = 48^\circ, B = 48^\circ, C = 84^\circ$ c. $A = 38^\circ, B = 76^\circ, C = 66^\circ$

6-4 Quadrilaterals (note answers are given line by line, left to right where applicable)

1. $62^\circ, 78^\circ, 102^\circ$ 2. $142^\circ, 95^\circ$, TO, Trapezoid
 3. Parallelogram, UC, 60° , 8.6 cm, 45° , 6.2 cm, 120°
 4. Rectangle, Right Scalene, Acute Isosceles, Obtuse Isosceles,
 10 cm, 37° , 10 cm, 53° , 5 cm, $53^\circ, 74^\circ$
 5. Rhombus, Obtuse Isosceles, Acute Isosceles, Right Scalene, $90^\circ, 30^\circ, 30^\circ, 60^\circ, 60^\circ,$
 $60^\circ, 120^\circ, 60^\circ$
 6. Parallelogram, 3.09 cm, 25° , 5.2 cm, $83^\circ, 110^\circ, 27^\circ, 70^\circ, 27^\circ, 45^\circ, 52^\circ$
 7. Square, 7.1 cm, 7.1 cm, 90° , 3.55 cm, 45°
 8. a. F b. T c. F d. F e. F f. T g. T

6-5 Problems

1. 24, 144° 2. 27, 36° 3. 17, 98°
 4. $g = 8, k = 9, PMR = 53^\circ, LMN = 53^\circ, QNM = 98^\circ, MNL = 82^\circ, MLN = 45^\circ$
 5. $x = 14, P = 112$ 6. $p = 5, A = 54$ 7. (1, -2) 8. all 3 points work 9. (4,2), (0,-4), (-8,
 2) 10. 24 11a. 150° b. $8\pi \approx 25.12$ cm 12. $120^\circ, 30^\circ, 60^\circ, 60^\circ$ 13. $15^\circ, 75^\circ, 90^\circ$
 14. $A = 30^\circ, B = 15^\circ, C = 135^\circ$ 15. a. $20^\circ, 80^\circ, 100^\circ, 160^\circ$ b. possibly trapezoid
 16. $36^\circ, 72^\circ, 72^\circ$ 17. $95^\circ, 85^\circ$ 18. Isosceles ($x = 7$)

UNIT 7: TWO DIMENSIONAL MEASUREMENT

7-1 Perimeter

- 1a. about 20.9cm b. about 15.8cm 2a. 34cm b. 22cm c. 48cm d. 80cm e. 24cm
 f. $\sqrt{96} + 16$ cm ≈ 25.8 cm g. 46cm h. 24cm i. 48cm j. 50cm 3. 7cm
 4. $h = 11$ cm, $b = 25$ cm 5. 108m 6. 45,45,9 7. 28cm 8. $\sqrt{128} \approx 11.3$ cm

9.	Name	# of sides	side length	perimeter
				18cm
	octagon			32cm
		5		35cm

	7	12cm	
quadrilateral	4		
hexagon		9cm	
	10	7.2cm	
nonagon	9		

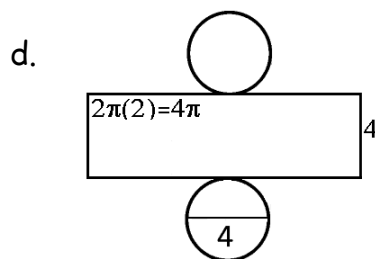
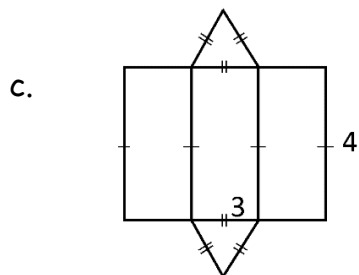
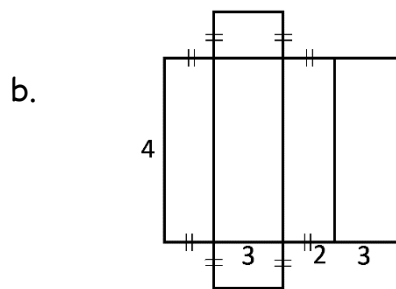
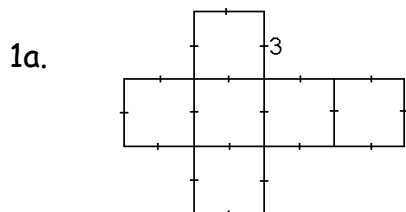
7-2 Area

1. answers may vary 2a. 60 m^2 b. 30 m^2 c. 110 cm^2 d. 6 m^2 e. 160 mm^2 f. 174 cm^2
g. 150 cm^2 h. 103 m^2 i. 42 cm^2 3. 6 cm 4. 6 cm 5. 32 cm 6. 81 cm^2
7a. 74 cm b. 24 cm 8. 270 cm^2 9. 70 mm 10. 300 cm^2 (from an isosceles triangle)
11. 120 cm^2 12a. 1792 ft^2 b. $\$160$ c. $\$152$

7-3 Circles: Area and Circumference

- 1a. $A = 100\pi \text{ cm}^2$, $C = 20\pi \text{ cm}$ b. $A = 9\pi \text{ cm}^2$, $C = 6\pi \text{ cm}$ c. $A = 25\pi \text{ cm}^2$, $C = 10\pi \text{ cm}$
d. $A = 16\pi$, $C = 8\pi$ 2a. 8 cm b. $A = 64\pi \text{ cm}^2$ 3. $8\pi \text{ cm}$ 4. $25\pi \text{ cm}^2$
5. 141 alligators, please don't go swimming!
6a. $A = 50\pi \text{ cm}^2$, $P = 10\pi + 20 \text{ cm}$ b. $A = 9\pi \text{ cm}^2$, $P = 3\pi + 12 \text{ cm}$
c. $A = 48\pi \text{ m}^2$, $P = 12\pi + 16 \text{ m}$ d. $A = 16\pi \text{ cm}^2$, $P = 16\pi \text{ cm}$
e. $A = 8\pi \text{ m}^2$, $P = 8\pi \text{ m}$ f. $A = 50\pi + 96 \text{ cm}^2$, $P = 10\pi + 28 \text{ cm}$
g. $A = 28\pi \text{ cm}^2$ 7. $50.25\pi \text{ m}^2$ or $\frac{201}{4}\pi \text{ m}^2$ or 157.79 m^2

7.4 Nets



7.5 Surface Area of Prisms and Cylinders

- 1a. 54 b. 52 c. 43.8 d. 41.12
2a. 22 b. 34 c. 26 d. 32 e. 46
3a. 190 b. $70x^2$ c. d. 226 e. 1440

- 4a. 260π b. 144π c. 56π
 5a. $40 + 20\pi$ b. $288 + 192\pi$ c. $7.68 - 0.1\pi$
 6a. 7 by 21 by 10.5 b. $h = 5$

7.6 Volume of Prisms and Cylinders

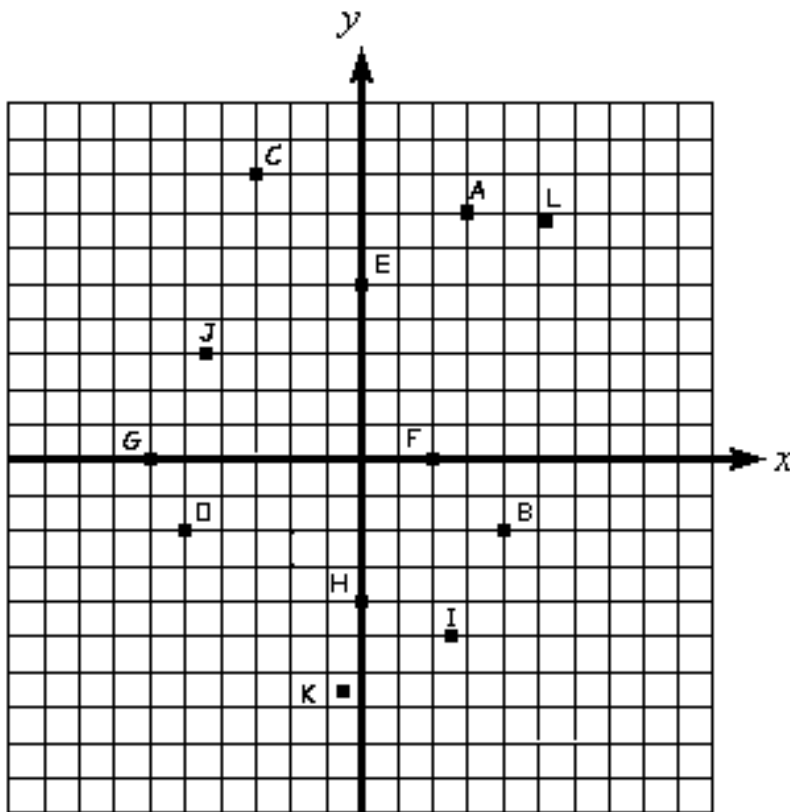
- 1a. 27 b. 24 c. 31.2 d. 16π
 2a. 150 b. $24x^3$ c. d. 165 e. 1120
 3a. 300π b. 216π c. 48π
 4a. 20π b. 384π c. $1.024 - 0.1\pi$
 5a. Volume: 8 times bigger; Surface Area: 4 times bigger
 b. Volume doubles
 c. Volume is half

UNIT 8: DATA ANALYSIS

8-1 Coordinates and Graphing

- 1A. (-2, 4) B. (3, 4) C. (3, -4) D. (-2, -3) E. (4, 2) F. (5, 0) G. (-3, -1)
 H. (-3.5, 2.5) I. (0.5, -2) J. (0, 2) K. (-4, 0) L. (0, -5.5)
 2a. 4 units b. 7 units c. 7 units d. $(\pm 5, 0), (0, \pm 5), (\pm 3, \pm 4), (\pm 4, \pm 3)$

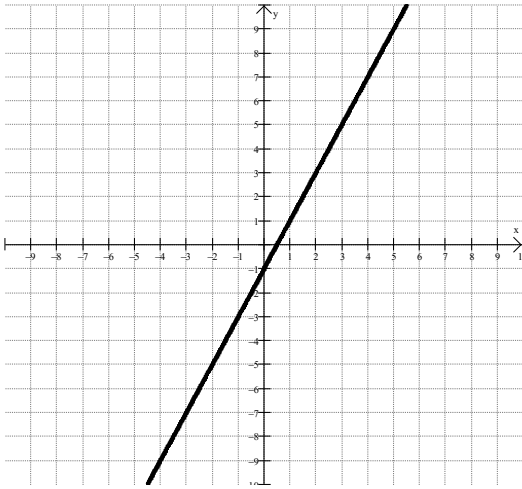
3.



4a.

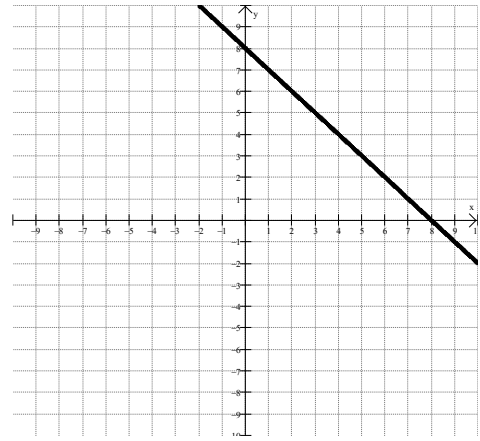
y	-1	3	-9	0	1	-3	9	-6
x	0	2	-4	0.5	1	-1	5	-2.5

4b.

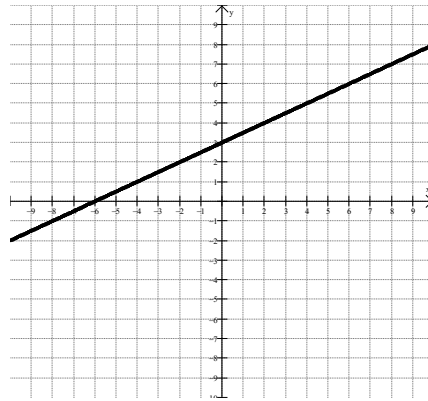


5a. answers may vary

b.



6. answers may vary b.



7. answers may vary

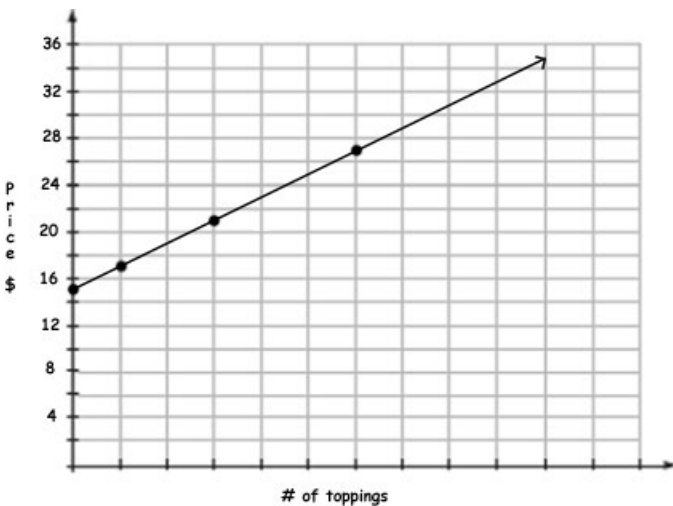
8a. (7,3) and (2,-2) or (2,-7) and (-3,-2) or (12,3) and (7,8) b. 25 or 50 square units

9. (-3, -2) and (-3, -5) 10a. 25 square units b. $\sqrt{50} \approx 7.1$ units 11a. parallelogram

b. 21 square units c. 24 units 12. $y = 0.5x - 2$ and $y = -3x + 3$

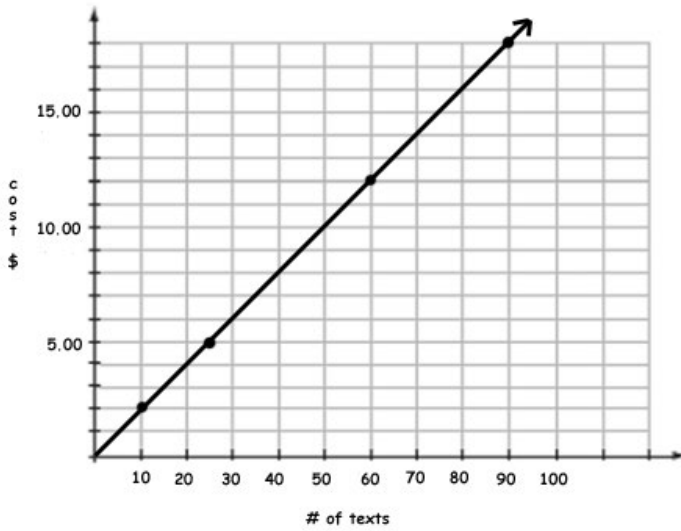
8-2 Graphing Data I (Line Graphs)

1.



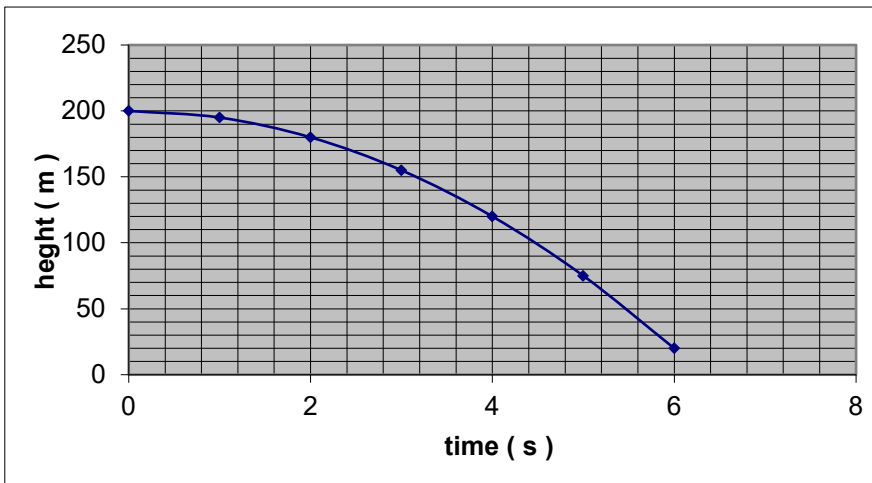
- a. \$15
- b. \$25
- c. 9
- d. \$2
- e. $P = 2T + 15$

2.



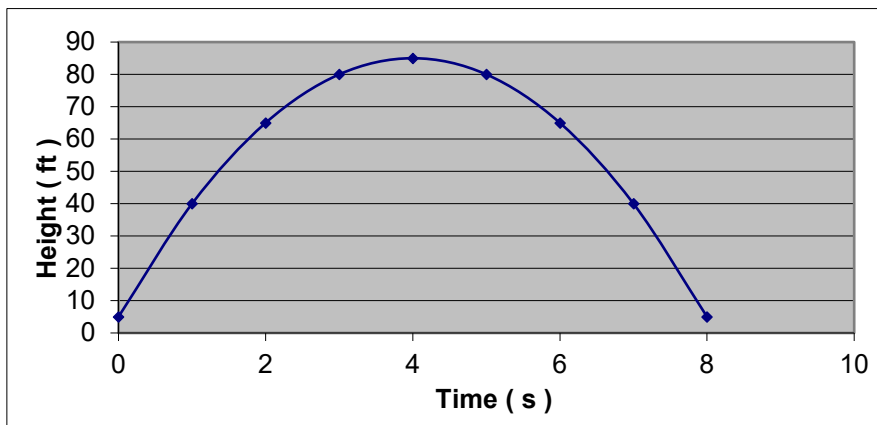
- a. \$16
- b. 75
- c. \$0.20
- d. $C = 0.2T$

3.



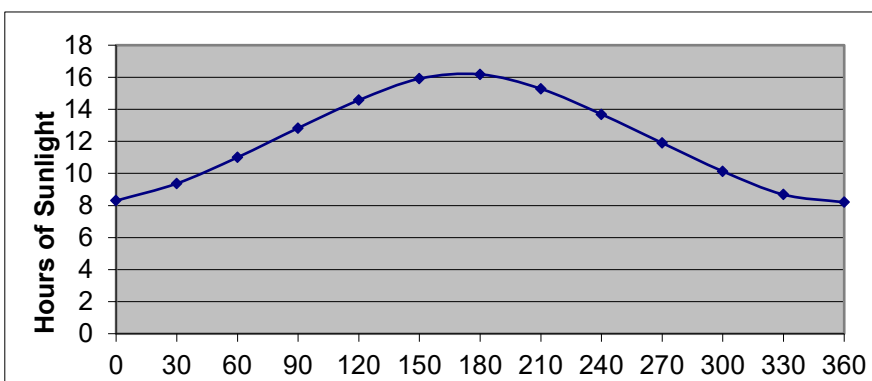
- a. answers may vary
- b. about 6.5 seconds

4.



- a. parabola
- b. the balloon was already at a height of 5 ft when it was launched.

5.



- a. early June b. late December c. mid-March until late September
 d. answers may vary (less overall difference between highest and lowest)
 e. answers may vary (should look like a vertical reflection of the graph above)

6. answers may vary 7. answers may vary

8-3 Graphing Data II Answers to be discussed in class

8-4 Probability

- 1a. $\frac{1}{6}$ b. $\frac{3}{6} = \frac{1}{2}$ c. $\frac{2}{6} = \frac{1}{3}$ d. $\frac{4}{6} = \frac{2}{3}$ e. $\frac{5}{6}$ f. $\frac{6}{6} = 1$
 g. 0 h. $\frac{4}{6} = \frac{2}{3}$ i. $\frac{3}{6} = \frac{1}{2}$
 2a. $\frac{26}{52} = \frac{1}{2}$ b. $\frac{13}{52} = \frac{1}{4}$ c. $\frac{4}{52} = \frac{1}{13}$ d. $\frac{1}{52}$ e. $\frac{2}{52} = \frac{1}{26}$ f. $\frac{12}{52} = \frac{3}{13}$ g.
 $\frac{48}{52} = \frac{12}{13}$ h. $\frac{8}{52} = \frac{2}{13}$ i. 0
 3a. $\frac{7}{20}$ b. $\frac{2}{20} = \frac{1}{10}$ c. $\frac{5}{20} = \frac{1}{4}$ d. $\frac{11}{20}$ e. 0 f. $\frac{14}{20} = \frac{7}{10}$

8-5 Independent Events

- 1a. $\frac{1}{12}$ b. $\frac{3}{12} = \frac{1}{4}$ c. $\frac{2}{12} = \frac{1}{6}$
 d. by multiplying individual probabilities, for 1a. $\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$
 2a. $\frac{26}{52} \times \frac{1}{6} = \frac{1}{12}$ b. $\frac{4}{52} \times \frac{1}{6} = \frac{1}{78}$ c. $\frac{13}{52} \times \frac{2}{6} = \frac{1}{12}$ d. $\frac{12}{52} \times \frac{3}{6} = \frac{3}{26}$
 e. $\frac{8}{52} \times \frac{3}{6} = \frac{1}{13}$ f. $\frac{48}{52} \times \frac{5}{6} = \frac{10}{13}$ g. $\frac{2}{52} \times \frac{4}{6} = \frac{1}{39}$
 3b. $\frac{27}{125} = 0.216$ c. $\frac{8}{125} = 0.064$ d. $\frac{18}{125} = 0.144$ e. $\frac{54}{125} = 0.432$ f. $\frac{12}{125} = 0.096$
 4a. $\frac{2}{3}$ b. $\frac{3}{3}$ c. $\frac{1}{3}$ d. 0 e. $\frac{4}{9}$ f. $\frac{5}{9}$
 5a. $\frac{1}{4}$ b. $\frac{3}{8}$ c. $\frac{1}{16}$ d. $\frac{15}{16}$ 6a. no, answers may vary b. $\frac{1}{4} \times \frac{3}{4} = \frac{3}{16} = 0.1875$

$$\begin{array}{lll} \text{c. } \frac{1}{4} \times \frac{3}{4} + \frac{3}{4} \times \frac{1}{4} = \frac{6}{16} = 0.375 & \text{d. } 3 \left(\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4} \right) = \frac{27}{64} = 0.421875 & \text{e. } \frac{3}{4} \times \frac{3}{4} = \frac{9}{16} = 0.5625 \\ \text{f. } \left(\frac{3}{4} \right)^3 = \frac{27}{64} = 0.421875 & \text{g. } \left(\frac{3}{4} \right)^4 = \frac{81}{256} = 0.3164 & \text{h. } 1 - \frac{81}{256} = \frac{175}{256} = 0.6836 \end{array}$$