

**Section 1, Whole Numbers**

Answers – Exercise 1.1



1.
  - a. 35
  - b. 305
  - c. 350
  
2.
  - a. One hundred and ten
  - b. One hundred and one
  - c. One
  - d. Eleven
  
3.
  - a. 712,201
  - b. 16,987,853
  
- 4.

Number in words	millions	hundred thousands	ten thousands	thousands	hundreds	tens	units
Sixty-two thousand			6	2	0	0	0
Eight million, thirty thousand and fifty-three	8	0	3	0	0	5	3
One hundred and six thousand and thirty-three		1	0	6	0	3	3

Answers – Exercise 1.2



1. (a) 35 (b) 305 (c) 350
2. (a) 79 (b) 709 (c) 790
3. (a) Nine hundred and eighty  
(b) Ninety eight  
(c) Nine hundred and eight
4. (a) Eight hundred  
(b) Eighty  
(c) Eight
5. (a) Eighty nine  
(b) Eight hundred and ninety  
(c) Eight hundred and nine
- 6.

Number in words	Figures		
	hundreds	tens	units
twenty four		2	4
nineteen		1	9
seventy six		7	6
eight			8
one hundred and sixty four	1	6	4
seven hundred and eight	7	0	8
three			3
sixty one		6	1
two hundred and fifty four	2	5	4
fifty eight		5	8

7. 542 Five hundreds, four tens, two units
8. (a) Units (b) Hundreds (c) Tens (d) Units
9. (b) 890
10. (e) 13  
(d) 31  
(a) 103  
(c) 130  
(b) 301  
(f) 310

Answers – Exercise 1.3

1. (a) 2,451 (b) 5,300 (c) 75,142 (d) 114,613
2. (a) Five thousand, seven hundred and sixty three  
 (b) Eight hundred and nine thousand  
 (c) Seven thousand and nine  
 (d) Three hundred and four thousand and twenty one



3. Number in words	hundred thousands	ten thousands	thousands	hundreds	tens	units
Five thousand			5	0	0	0
Sixty two thousand		6	2	0	0	0
Three hundred thousand	3	0	0	0	0	0
Seventy four thousand and nine		7	4	0	0	9
Six hundred thousand, two hundred	6	0	0	2	0	0
Seventy thousand and fifty		7	0	0	5	0
Ninety nine thousand		9	9	0	0	0
Six thousand			6	0	0	0

4. 600,000,000  
 5. 324,000,567  
 6. 999,000,000
7. One hundred and eighty nine million
8. Five million, eight hundred and sixty nine thousand and fourteen
9. One hundred and sixty seven million, one hundred and eighty nine thousand, one hundred and twelve
- 10.

Number in words	billions	hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	units
One billion, six hundred and ten million	1	6	1	0	0	0	0	0	0	0
Eight million, thirty thousand and fifty three				8	0	3	0	0	5	3
Seven hundred and six million		7	0	6	0	0	0	0	0	0

**Section 2, Estimating & Rounding**

Answers – Exercise 1.4

1.    a.     74,970  
      b.     75,000  
      c.     75,000
2.     4,000,000 + 7,000,000 = 11,000,000
3.     £200 x 10 = £2,000
4.     10 x 90 = 900 ft



Answers – Exercise 1.5

1.    (a) 40            (b) 60            (c) 200            (d) 100            (e) 1,010



Answers – Exercise 1.6

1.    (a) 200            (b) 100            (c) 1,100            (d) 5,000            (e) 31,400



Answers – Exercise 1.7

1.    (a)    1,213,890  
      (b)    1,213,900  
      (c)    1,210,000  
      (d)    1,000,000
2.     40 miles
3.     2,000
4.     40,000



Answers – Exercise 1.8

1.     60 + 90 + 50 + 30 + 90 + 150            =            £4.70
2.     (b)    £10 x 150 = £1,500
3.     (c)    2 x £475 = £950
4.     5,000 pounds
5.     £20

**Section 3, Basic Calculations**

Answers – Exercise 1.9

1. Estimate	2. Manual	3. Calculator
(a) 2,100	2,180	2,180
(b) 6,100	6,075	6,075
(c) 650,000	623,734	623,734
(d) 225	219	219
(e) 470	469	469
(f) 1,600,000	1,598,660	1,598,660



Answers – Exercise 1.10

1. Estimate	2. Manual	3. Calculator
(a) 40	35	35
(b) 30	33	33
(c) 4,600	4,559	4,559
(d) 4,000	3,903	3,903
(e) 20,000	18,777	18,777



Answers – Exercise 1.11

1. Estimate	2. Manual	3. Calculator
(a) 100	81	81
(b) 50	36	36
(c) 20	24	24
(d) 35	42	42
(e) 20	16	16



Answers – Exercise 1.12

1. 4,536
2. 2,196
3. 5,418
4. 5,306
5. 2,149



Answers - Exercise 1.13

1. 190
2. 38,000
3. 870,000
4. 1,440
5. 5,200
6. 6,240
7. 17,620



Answers – Exercise 1.14

1. 100
2. 1,049
3. 241
4. 436
5. 257



Answers – Exercise 1.15

1. 100 sacks
2. 24 sacks
3. 76 sacks
4. 7 days
5. 6 sacks



Answers – Exercise 1.16

5,200 horsepower



**Section 4, Fractions & Decimals**

Answers - Exercise 1.17

1.

Fraction	Decimal	Percentage
$\frac{3}{4}$	0.75	75%
$\frac{3}{5}$	0.6	60%
$\frac{21}{25}$	0.84	84%
$\frac{7}{20}$	0.35	35%
$\frac{5}{8}$	0.625	62.5%



2. 0.091      0.109      0.19      0.9

3.  $\frac{1}{3}$        $\frac{5}{12}$        $\frac{1}{2}$        $\frac{5}{6}$

4. 1.001      1.01      1.101      1.11

5.  $\frac{50}{151}$

6.  $\frac{1}{2}$       or 0.5

Answers - Exercise 1.18

1. a. 

b. 

c. 

2. a.  $\frac{1}{4}$

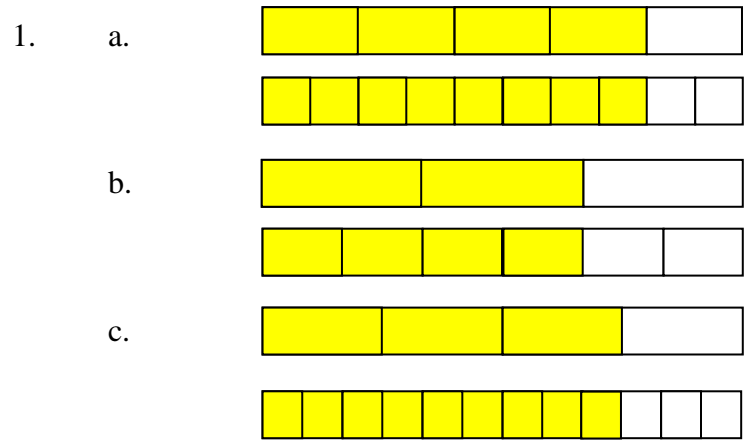
3. a.  $\frac{2}{8} = \frac{1}{4}$

b.  $\frac{2}{8} = \frac{1}{4}$

c.  $\frac{4}{8} = \frac{1}{2}$



Answers – Exercise 1.19



2. a. 5  
 b. 10  
 c. 4  
 d. 16

3. a.  $\frac{2}{3}$   
 b.  $\frac{1}{4}$   
 c.  $\frac{3}{5}$   
 d.  $\frac{1}{3}$   
 e.  $\frac{1}{2}$   
 f.  $\frac{7}{8}$

Answers – Exercise 1.20



1.  $2\frac{3}{4}$   
 2.  $3\frac{2}{3}$   
 3.  $2\frac{1}{7}$   
 4.  $2\frac{1}{8}$   
 5.  $6\frac{3}{8}$



Answers – Exercise 1.21

1.  $\frac{7}{2}$
2.  $\frac{23}{4}$
3.  $\frac{19}{3}$
4.  $\frac{14}{3}$
5.  $\frac{15}{2}$
6.  $\frac{5}{2}$



Answers – Exercise 1.22

- |                     |                     |
|---------------------|---------------------|
| 1. $1\frac{1}{4}$   | 6. $8\frac{1}{4}$   |
| 2. $\frac{5}{6}$    | 7. $7\frac{7}{8}$   |
| 3. $1\frac{1}{12}$  | 8. $9\frac{5}{8}$   |
| 4. $1\frac{1}{2}$   | 9. $3\frac{9}{20}$  |
| 5. $1\frac{13}{24}$ | 10. $8\frac{7}{10}$ |



Answers – Exercise 1.23

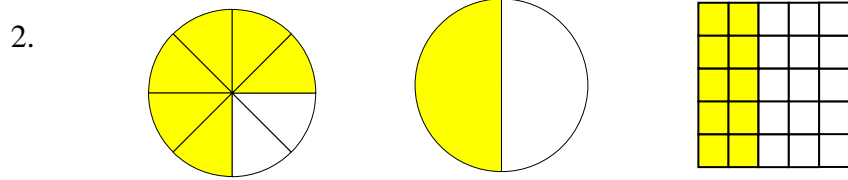
1.  $\frac{1}{10}$
2.  $\frac{3}{14}$
3.  $\frac{1}{8}$
4.  $\frac{1}{8}$
5. 1



Answers . . . Exercise 1.24



1. (a)  $\frac{1}{4}$   
 (b)  $\frac{3}{4}$   
 (c)  $\frac{1}{2}$



3. (a) 7  
 (b) 2  
 (c)  $\frac{2}{7}$

4. (a) 12  
 (b)  $\frac{1}{4}$

5. (a) 10  
 (i)  $\frac{8}{10}$   
 (ii)  $\frac{2}{10}$

6. (a)  $\frac{5}{11}$   
 (b)  $\frac{2}{11}$   
 (c)  $\frac{4}{11}$

7. (a)  $\frac{1}{4}$   
 (b)  $\frac{2}{3}$   
 (c)  $\frac{6}{10}$   
 (d)  $\frac{1}{12}$   
 (e)  $\frac{4}{5}$

Answers - Exercise 1.24 continued



8. Complete the table for the six diagrams below.

Shape	a	b	c	d	e	f
Fraction shaded	$\frac{2}{3}$	$\frac{5}{6}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{5}{7}$	$\frac{4}{11}$
Fraction unshaded	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{2}{7}$	$\frac{7}{11}$

9. (a) 5  
 (b) 10  
 (c) 5  
 (d) 72  
 (e) 21

10. (a)  $\frac{1}{3}$   
 (b)  $\frac{1}{4}$   
 (c)  $\frac{1}{7}$   
 (d)  $\frac{3}{5}$   
 (e)  $\frac{3}{5}$

11. (a)  $2\frac{1}{4}$   
 (b)  $3\frac{2}{3}$   
 (c)  $2\frac{1}{7}$   
 (d)  $4\frac{1}{5}$   
 (e)  $4\frac{5}{12}$

Answers – Exercise 1.24 continued



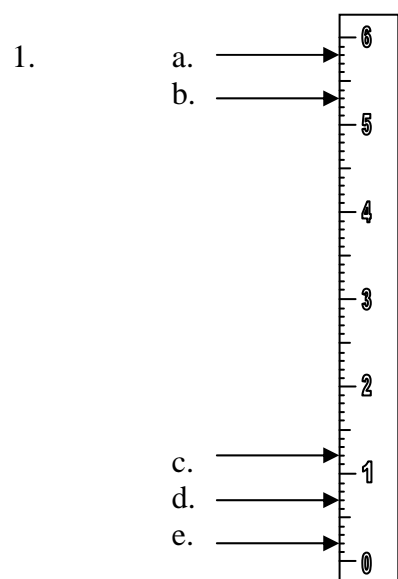
12. a.  $\frac{7}{4}$   
 b.  $\frac{23}{8}$   
 c.  $\frac{71}{15}$   
 d.  $\frac{77}{8}$   
 e.  $\frac{107}{8}$
13. a.  $1\frac{5}{12}$   
 b.  $6\frac{5}{12}$   
 c.  $\frac{1}{12}$   
 d.  $1\frac{1}{12}$

Answers – Exercise 1.25



	Tens	Units	.	tenths	hundredths	thousandths
1.		0	.	2		
2.		3	.	4		
3.	1	0	.	0	4	
4.	5	0	.	2	0	7
5.		3	.	8	1	7

Answers – Exercise 1.26



2. a. 0.7  
 b. 5.8  
 c. 1.2

Answers – Exercise 1.27

1. a. 48.8  
 b. 4.0  
 c. 6.0  
 d. 8  
 e. 0.7  
 f. 0.0055  
 g. 11.0001  
 h. 300.0  
 i. 2.02  
 j. 0.001

2. a. No 6.5  
 b. Yes  
 c. No 5.063



Answers – Exercise 1.28

1. 4.965          5          5.004          5.04          5.104

2. (a) 2.4  
(b) 73.2  
(c) 312.1

3. (a) 5.6  
(b) 31.2  
(c) 0.3  
(d) 20.5  
(e) 100.4  
(f) 0.01

4.

Numbers	8.35	1.7	0.04	0.2	5.08	15.63
Tenths	3	7	0	2	0	6
Hundredths	5	0	4	0	8	3

5. (a) £5.65  
(b) 2.1 metres  
(c) 0.71  
(d) 2.11  
(e) £10.01  
(f) 76.4  
(g) 3.1  
(h) 0.1

6. (a) 2.2  
(b) 3.5  
(c) 3.1  
(d) 2.65

7. (a) 40°C  
(b) 40 psi

8. (a) Jar 1 0.25 litre          Jar 2 0.6 litre          Jar 3 0.85 litre  
(b) Jar 1 0.75 litre          Jar 2 0.4 litre          Jar 3 0.15 litre



Answers – Exercise 1.29

1. a. 103.45  
b. 8.6  
c. 49.93  
d. 192.62  
e. 1,549.8

2. They should be the same as the manual calculations above.



Answers – Exercise 1.30

1. a. 4.32  
f. 1.39  
g. 5.1  
h. 56.49  
i. 314.82

2. They should be the same as the manual calculations above.



Answers – Exercise 1.31

1. a. 20.259  
b. 0.2416  
c. 0.0234  
d. 239.4  
e. 0.0261  
f. 30  
g. 25.05  
h. 243.8  
i. 92.64  
j. 163.84

2. a. 10,000  
b. 100  
c. 0.52  
d. 52  
e. 520  
f. 0.11  
g. 0.011  
h. 1,872.34  
i. 18.7234  
i. 2.943



Answers – Exercise 1.32

1. a. 17.5  
b. 9.7  
c. 2.03  
d. 0.184  
e. 0.51  
f. 106  
g. 105  
h. 1,200  
i. 583.33333  
j. 1,926.6055



Answers – Exercise 1.33

1.
  - a. 10.3
  - b. 9.8
  - c. 156.1
  - d. 32.9
  - e. 9.6
  
2.
  - a. 0.0178
  - b. 0.0243
  - c. 0.3887
  - d. 0.1738
  - e. 0.0119



Answers – Exercise 1.34

- a. Yes
- b. No
- c. No
- d. No
- e. No



Answers – Exercise 1.35

1.
  - a. £3
  - b. 4 centimetres
  - c. 9 metres
  - d. 6 minutes
  - e. 32 pence
  
2.
  - a. £9.00
  - b. 9 centimetres
  - c. 2 kilometres
  - d. 1 pence
  - e. 6 millimetres





Answers – Exercise 1.36

1. (a) (i) 0.9  
       (ii) 0.1  
     (b) (i) 9 litres  
        (ii) 10 litres
2. (a) 1:2  
    (b) 1:4  
    (c) 1:2  
    (d) 1:3  
    (e) 2:5  
    (f) 1:3  
    (g) 1:3  
    (h) 1:5  
    (i) 6:7  
    (j) 5:6
3. (a) 3:1  
    (b) 1:2  
    (c) 1:25  
    (d) 3:1  
    (e) 100:1  
    (f) 4:1  
    (g) 1:5  
    (h) 1:3  
    (i) 3:1  
    (j) 3:4



Answers – Exercise 1.37



1.
  - a. 0.5
  - b. 0.25
  - c. 0.333 answer to 3 decimal places
  - d. 0.125 answer to 3 decimal places
  - e. 0.143 answer to e decimal places
  
2.
  - a.  $\frac{1}{5}$
  - b.  $\frac{3}{4}$
  - c.  $\frac{3}{100}$
  - d.  $\frac{1}{8}$
  - e.  $\frac{3}{8}$
  
3.
  - a. 20%
  - b. 75%
  - c. 3%
  - d. 12.5%
  - e. 37.5%
  
4.
  - a. 50%
  - b. 25%
  - c. 33.3% answer to 1 decimal place
  - d. 62.5%
  - e. 37.5%
  - f. 200%
  - g. 175%
  
5.
  - a. 9.625
  - b. 13.375
  - c. 12.25
  - d. 8.5
  - e. 6.625

Answers – Exercise 1.38

1. a.  $\frac{1}{4}$   
b. 25%
2. a.  $\frac{3}{4}$   
b. 75%
3. 480
4. 2:1
5. 40.67 feet



Answers – Exercise 1.39

1. 625 rpm
2. 833 rpm
3. 1,250 rpm



Answers – Exercise 1.40

1. 141.12 pounds per foot
2. a. 38:1  
b. 38 inches
3. 3 times
4. 12.36 inches
5. a. 146 days  
b. 219 days



Answers – Exercise 1.41

1. 5 tonnes



Answers – Exercise 1.42

1. 1,200
2. 70%



**Section 5, Measurement, Volume & Pressure**

Answers – Exercise 1.43

1.
  - a. Capacity
  - b. Volume
  - c. Density
  
2.
  - a. Length
  - b. Density
  - c. Weight or mass
  - d. Volume
  - e. Length
  - f. Pressure
  
3. Imperial
  
4.
  - a. 178.1 barrels
  - b. 2 square feet
  - c. 144 inches
  - d. 127.16 pounds per cubic foot
  - e. 84 US gallons
  
5. c.



Answers – Exercise 1.44

1. b.
  
2. a., c., e.
  
3. c.



Answers – Exercise 1.45

1.
  - a. yards
  - b. inches
  - c. feet
  - d. miles
  
2.
  - a. 12
  - b. 3
  - c. 36 inches
  - d. 5,280 feet
  
3.
  - a. 5 feet 3 inches
  - b. 5.25 feet
  - c. 30.75 feet
  - d. 29 ft 6 inches
  
4. 91.83 feet
  
5. 100.03 feet
  
6.
  - a.  $2\frac{1}{8}$  inches
  - b. 3 inches
  - c.  $1\frac{1}{8}$  inches
  
7.
  - a. 10 inches
  - b. 13 inches
  - c. 12 inches
  - d. 12 inches
  
8.
  - a. 31 feet
  - b. 31 feet
  - c. 41 feet
  - d. 18 feet



Answers – Exercise 1.46

1. c.
  
2. b.
  
3. d.



Answers – Exercise 1.47

1.
  - a. square inches
  - b. square feet
  - c. square yards
  - d. square miles
  
2.
  - a. 1 square feet
  - b. 2 square feet
  - c. 9 square feet
  - d. 1 square miles
  
3.
  - a. 1.9 square feet
  - b. 63 square feet
  - c. 3.7 square yards
  - d. 1,548,800 square yards
  
4.
  - a. 2,000 square feet
  - b. 200 square feet
  - c. 240 square feet
  - d. 1,560 square feet



Answers – Exercise 1.48

1. c.
2. a.
3. c.



Answers – Exercise 1.49

1.
  - a. gallons
  - b. barrels
  - c. cubic feet
  - d. pint
  - e. cubic inches
  
2.
  - a. 1 cubic foot
  - b. 1 barrel
  - c. 1 barrel
  - d. 1 cubic foot
  
3.
  - a. 748 gallons
  - b. 320.6 barrels
  - c. 504 gallons
  - d. 21 gallons
  - e. 276 barrels
  
4. 754 barrels



Answers – Exercise 1.50

1.    Weight        b.  
      Mass         a.
2.    a.     True  
      b.     False
3.    d.



Answers – Exercise 1.51

1.    a.     pounds  
      b.     tons  
      c.     stones  
      d.     hundredweight  
      e.     ounces
2.    a.     1 pound  
      b.     1 long ton  
      c.     1 metric tonne  
      d.     1 stone
3.    a.     4 ounces  
      b.     2 pounds  
      c.     6,615 pounds  
      d.     5 metric tonnes
4.    a.     750 pounds  
      b.     0.34 metric tonnes
5.    a.     500 pounds  
      b.     0.23 metric tonne
6.    a.     225,600 pounds  
      b.     102.31 metric tonnes



Answers – Exercise 1.52

1.    a.     5  
      b.     8
2.    a.     1  
      b.     2
3.    a.     6  
      b.     11
4.    a.     7  
      b.     12



Answers – Exercise 1.53

1. 250 kilograms
2. 5 hours or 300 minutes



Answers – Exercise 1.54

1. a.
2. a.
3. b.



Answers – Exercise 1.55

1. a. gas, oil, water, drilling mud  
b. ping-pong ball, golf ball, lead fishing weight
2. a. 10 ppg  
b. 100 pcf
3. 1 gallon weighing 15 lbs (a).
4. a. 15 ppg  
b. 10 ppg



Answers – Exercise 1.56

1. c.
2. a.
3. b.



Answers – Exercise 1.57

1. Pounds per square inch
2. a. 1 psi  
b. 10 psi  
c. 100 psi  
d. 237 psi
3. Increase
4. 5 psi





Answers – Exercise 1.58

1. 2,000 feet
2. 210,000 pounds
3. 155.5 pounds per square foot



Answers – Exercise 1.59

1. 744 feet
2. 13,950 pounds
3. a. 1,395 pounds per square foot  
b. 10 pounds per square inch



**Section 6, Mathematical Symbols, Equations and Operations**

Answers – Exercise 1.60

1.
  - a. square root
  - b. percentage
  - c. multiply
  - d. squared
  - e. equals
  
2.
  - a. 72.25
  - b. 13
  - c. 10
  - d. 0.035
  - e. 0.1251
  - f. 8,000
  - g. 560



Answers – Exercise 1.61

1. 4
2. 64
3. 5625
4. 56.25
5. 92.64



Answers – Exercise 1.62

1. 7
2. 9
3. 20
4. 13.375
5. 8.5



Answers – Exercise 1.63

1. 12
2. 15.5
3. 0.0243



Answers – Exercise 1.64

1. 384.8
2. 328.7



Answers – Exercise 1.65

1. 2,160
2. 448
3. 4,800
4. 52,150
5. 1,043



Answers – Exercise 1.66

1. 890
2. 40
3. 20



Answers – Exercise 1.67

1.
  - a. %
  - b.  $\div$
  - c.  $\sqrt{\quad}$
  - d.  $x^2$
  - e. =
2.
  - a. 64
  - b. 49
  - c. 150.06
  - d. 72.25
  - e. 92.64
  - f. 9
  - g. 12
  - h. 20
  - i. 11
  - j. 2
3.
  - a. 10
  - b. 0.0243
  - c. 0.1215
  - d. 4,537.5
  - e. 749.6



**Section 7, Solving Equations**

Answers – Exercise 1.68

1.    a.    4  
      b.    12  
      c.    67
  
2.    a.    15  
      b.    12  
      c.    33
  
3.    a.    4  
      b.    5  
      c.    2  
      d.    3
  
4.    a.    39 mph  
      b.    507 mph
  
5.    a.    204 miles  
      b.    9 hours



Answers – Exercise 1.69

1.    12
2.    10
3.    1.2
4.    424
5.    0.15
6.    1120 feet



Answers – Exercise 1.70

1.    2
2.    20
3.    2
4.    73
5.    471
6.    69
7.    7
8.    14
9.    62
10.  13



Answers – Exercise 1.71

1. 9
2. 14



Answers – Exercise 1.72

1.  $3z$
2.  $5y$
3.  $5p$
4.  $3w$
5.  $10x$



Answers – Exercise 1.73

1. 150
2. 800
3. 16
4. 66
5. 1



Answers – Exercise 1.74

1. 7
2. 5
3. 12
4. 3
5. 3



Answers – Exercise 1.75

1. 2
2. 7
3. 2
4. 8
5. 3



Answers – Exercise 1.76

1.
  - a. 3
  - b. 1
  - c. 6
  - d. 3
  - e. 2
  
2.
  - a. 27
  - b. 45
  - c. 1
  - d. 100
  - e. 1
  
3.
  - a. 12
  - b. 5
  - c. 7
  - d. 6
  - e. 2



Answers – Exercise 1.77

1.
  - a. 35 mph
  - b. 70 mph
  - c. 50 mph
  
2.
  - a. 50 mph
  - b. 40 mph
  - c. 33 mph (answer rounded to whole number)



Answers – Exercise 1.78

1. 100 °C
2. 44.4 °C
3. 29.4 °C
4. 21.1 °C
5. 0 °C



Answers – Exercise 1.79

1. 
$$\text{Euros} = \frac{\text{Pounds Sterling}}{0.63}$$
  
2. 
$$\text{Mud density} = \frac{\text{Pressure gradient}}{0.052}$$
  
3. Rows of bricks = Height of wall x 3



Answers – Exercise 1.80

1.  $\text{Width} = \frac{\text{Area}}{\text{Length}}$
2.  $\text{Length} = \frac{\text{Area}}{\text{Width}}$



Answers – Exercise 1.81

1.  $M = \frac{P}{0.052}$
2.  $H = F - S$
3.  $A = \frac{V}{L}$



Answers – Exercise 1.82

1.
  - a. 5,200 psi
  - b. 6,240 psi
  - c. 6,864 psi
2.
  - a. 11.0 ppg
  - b. 13.0 ppg
  - c. 14.0 ppg
3.
  - a. 15,100 ft
  - b. 16,000 ft
  - c. 8,000 ft



Answers – Exercise 1.83

1. \$83,800
2. 9 hours



Answers – Exercise 1.84

1. 9.84
2. 20.32
3. 37.67
4. 13.06
5. 0.93
6. 2.7
7. 840
8. 63.59
9. 127187
10. 81.8
11. 1.62
12. 15.4
13. 109.3
14. 26.46
15. 64.86
16. 17225
17. 238
18. 17400
19. 1139.8
20. 4.8

Answers – Exercise 1.85

1. 3.28
2. 0.50
3. 2950.46
4. 96.77
5. 0.09
6. 733
7. 19.6
8. 22.8
9. 40404
10. 8310
11. 12.5
12. 11.2
13. 1.77
14. 91.3
15. 1.18
16. 93.6
17. 17637
18. 540
19. 3179.68
20. 353.15