

## Chapter 2 Review of Basic Algebra

### Exercise 2.1

- A. 1.  $19a$   
2.  $3m$   
3.  $-a - 10$   
4.  $-3a - 14$   
5.  $-2x - 4y$   
6.  $3p + q$   
7.  $14f - 4v$   
8.  $2c - 3d$   
9.  $0.8x$   
10.  $1.06x$   
11.  $1.4x$   
12.  $0.98x$   
13.  $2.79x$   
14.  $4.05y$   
15.  $-x^2 - x - 8$   
16.  $-ax + x - 2$   
17.  $x - 7y$   
18.  $2a - 2$   
19.  $4b + 2c + 2$   
20.  $-2a^2 - 6ab + 5b^2$   
21.  $-m^2 + 6m + 1$   
22.  $14 - 9x + y$   
23.  $10a - 14b$   
24.  $2f + 2f^2 + 3fg$
- B. 1.  $-12x$   
2.  $-56a$   
3.  $-10ax$

4.  $27ab$

5.  $-2x^2$

6.  $24m^2$

7.  $60xy$

8.  $-24abc$

9.  $-2x + 4y$

10.  $10x - 20$

11.  $2ax^2 - 3ax - a$

12.  $-24x + 12bx + 6b^2x$

13.  $35x - 30$

14.  $-10a - 15b$

15.  $-20ax + 5a$

16.  $21y - 31$

17.  $3x^2 + 5x - 2$

18.  $5m^2 - 17mn + 6n^2$

19.  $x^3 + y^3$

20.  $a^3 - 3a^2 + 3a - 1$

21.  $7x^2 + 3x + 39$

22.  $-5a^2 - 13a + 12$

23.  $4ab$

24.  $-5y$

25.  $4x$

26.  $-6$

27.  $10m - 4$

28.  $-2x + 3$

29.  $-2x^2 + 3x + 6$

30.  $a^2 + 4a + 3$

C. 1.  $-5$

2.  $14$

3.  $5500$

4. 20 000
5. 0.58604
6. \$40.50
7. \$378
8. 0.125
9. \$3000
10.  $0.\dot{1}\dot{3}$
11. \$901.99
12. \$1052.71
13. \$1400.06
14. \$1600.08

***Exercise 2.2***

- A.
1. 81
  2. 1
  3. 16
  4. 1
  5.  $\frac{16}{81}$
  6.  $\frac{625}{1296}$
  7.  $-\frac{1}{64}$
  8.  $-\frac{8}{27}$
  9. 0.25
  10. 113.379904
  11. -0.001
  12. -335.544320
  13. 1
  14. 1

15.  $\frac{1}{9}$

16. 512

17.  $-\frac{1}{125}$

18.  $\frac{1}{167.9616}$

19. 125

20.  $\frac{81}{16}$

21.  $\frac{1}{1.01}$

22. 1

B. 1.  $2^8$

2.  $(-4)^4$

3.  $4^3$

4.  $(-3)^2$

5.  $2^{15}$

6.  $(-4)^{18}$

7.  $a^{14}$

8.  $m^5$

9.  $3^{11}$

10.  $(-1)^{15}$

11. 6

12.  $x^2$

13.  $\frac{3^{11}}{5^{11}}$

14.  $\frac{1}{6^2}$

15.  $\frac{(-3)^{11}}{2^{11}}$

16.  $-\frac{3}{4}$

17.  $1.025^{150}$

18.  $1.005^{90}$

19.  $1.04^{80}$

20.  $\frac{-3^{15}}{7^{15}}$

21.  $(1+i)^{200}$

22.  $(1-r)^6$

23.  $(1+i)^{160}$

24.  $(1-r)^{120}$

25.  $a^5b^5$

26.  $16x^4y^4$

27.  $m^{24}n^8$

28.  $\frac{a^{12}b^8}{x^4}$

29.  $2^4$

30.  $5^5$

31.  $\frac{b^8}{a^8}$

32.  $\frac{i^n}{(1+i)^n}$

**Exercise 2.3**

A. 1. 72.0000

2. 14.3500

3. 3.0000

4. 1.0100

5. 1.0759

6. 0.5000

7. 1.0133
8. 1.0117
- B. 1. 55
2. 7
3. 12.25
4. 60.154991
5. 1.071122
6. 1.015241
7. 0.629961
8. 0.995156
9. 163.053437
10. 16.546852
11. 2.158925
12. 0.589664
13. 1630.176673
14. 12 151.73813
15. 1139.915716
16. 1855.967995
17. 5000.00
18. 4391.497547
19. 0.029998
20. 0.019999
21. 0.04
22. 0.01

***Exercise 2.4***

- A. 1.  $9 = \log_2 512$
2.  $7 = \log_3 2187$

3.  $-3 = \log_5 \frac{1}{125}$

4.  $-5 = \log_{10} 0.00001$

5.  $2j = \ln 18$

6.  $-3x = \ln 12$

B. 1.  $2^5 = 32$

2.  $3^{-4} = \frac{1}{81}$

3.  $10^1 = 10$

4.  $e^2 = e^2$

C. 1. 0.693147

2. 5.298317

3. -2.253795

4. 7.133435

5. 6.825303

6. 10.156367

***Business Math News Box***

1. \$133 900 000 (C\$133.9 million)

2.  $\text{C}\$133.9 \times 10^6$

3.  $\text{C}\$2678 \times 10^6$  million

4. 14.73% per year

***Exercise 2.5***

A. 1.  $x = 3$

2.  $x = -5$

3.  $x = 80$

4.  $x = 650$

5.  $x = 18$

6.  $x = -56$

7.  $x = -35$

8.  $x = 24$

9.  $x = -4$

10.  $x = 7$

11.  $x = -8$

12.  $x = 9$

13.  $x = 5$

14.  $x = -12$

15.  $x = 20$

16.  $x = 300$

17.  $x = 200$

18.  $x = 60$

B. 1.  $x = 4$

2.  $x = 3$

3.  $x = 0$

4.  $x = -2$

5.  $x = 5$

6.  $x = -2$

7.  $x = 21$

8.  $x = 8$

### ***Exercise 2.6***

A. 1.  $x = -10$

2.  $x = -2$

3.  $x = -3$

4.  $x = 5$

5.  $x = 3$

6.  $x = 5$

7.  $x = 14$

8.  $x = 2$

B. 1.  $x = 20$



2.  $x = 16$

3.  $x = -1$

4.  $x = 3$

5.  $x = \frac{1}{2}$

6.  $x = -\frac{2}{3}$

C. 1.  $x = -1$

2.  $x = 2$

3.  $x = \frac{5}{6}$

4.  $x = -\frac{3}{4}$

D. 1.  $x = \frac{y-b}{m}$

2.  $S = \frac{M}{r}$

3.  $\text{PMT} = \text{PVi}$

4.  $t = \frac{I}{Pr}$

5.  $r = \frac{S-P}{Pt}$

6.  $i = \left[ \frac{\text{FV}}{\text{PV}} \right]^{\frac{1}{n}} - 1$

**Exercise 2.7**

A. 1. \$28.28.

2. \$864.

3. \$35.00.

4. \$18.90.

5. 192.

6. \$11.36.
7. \$670.
8. 65 cm.
9. \$89.00.
10. \$23 500.
11. 1300.
12. 18.
13. 20 units.
14. 20 dimes, 56 nickels, and 16 quarters.
15. 30 \$12 tickets,  
100 \$ 8 tickets,  
and 21 \$15 tickets.
16. 6 medium pizzas,  
17 large pizzas,  
and 13 small pizzas.

***Review Exercise***

1. (a)  $-2x - 7y$   
(b)  $1.97x$   
(c)  $6a - 7$   
(d)  $x + 3y$   
(e)  $9a^2 - 4b - 4c$   
(f)  $-x^2 + 3x + 1$
2. (a)  $-15a$   
(b)  $28mx$   
(c)  $-7$   
(d)  $-3ab$   
(e)  $36xy$   
(f)  $24abc$   
(g)  $-12x + 20y + 4$

(h)  $x - 2x^2 - x^3$

(i)  $-6x + 4$

(j)  $7a - 4$

(k)  $26a - 29$

(l)  $14ax - 2a^2 + 10a$

(m)  $2m^2 - 7m + 5$

(n)  $3a^3 - 8a^2 - 5a + 6$

(o)  $-14x^2 + 34x + 36$

(p)  $-26am^2 + 26am + 37a$

3. (a)  $-47$

(b)  $6\frac{1}{3}$

(c)  $0.16$

(d)  $200$

(e)  $\$645.44$

(f)  $2500$

4. (a)  $-243$

(b)  $\frac{16}{81}$

(c)  $1$

(d)  $-\frac{1}{3}$

(e)  $\frac{625}{16}$

(f)  $1$

(g)  $-19\,683$

(h)  $1024$

(i)  $59\,049$

(j)  $m^{12}$

(k)  $\frac{16}{81}$

(l)  $\frac{25}{16}$

(m)  $1.03^{150}$

(n)  $(1+i)^{80}$

(o)  $1.05^{150}$

(p)  $16x^4y^4$

(q)  $\frac{81}{a^8b^4}$

(r)  $\frac{1}{(1+i)^n}$

5. (a) 0.96

(b) 1.012126

(c) 1.07

(d) 0.968442

(e) 1.098612

(f) -2.995732

(g) 7.087540

(h) 9.871647

6. (a)  $x = -7$

(b)  $x = 880$

(c)  $x = -21$

(d)  $x = -18$

(e)  $x = 3$

(f)  $x = -11$

(g)  $x = 250$

(h)  $x = 40$

(i)  $x = -1$

(j)  $x = 7$

(k)  $x = 39$

(l)  $x = 56$

7. (a)  $x = -7$

(b)  $x = 5$

(c)  $x = -3$

(d)  $x = -\frac{7}{12}$

(e)  $x = 7$

(f)  $x = -\frac{1}{3}$

(g)  $x = -\frac{1}{2}$

8. (a)  $r = \frac{I}{Pt}$

(b)  $t = \frac{S-P}{Pr}$

(c)  $r = \frac{D}{L}$

(d)  $\text{PMT} = \left[ \frac{FVp}{(1+p)^n - 1} \right]$

9. (a) 138.

(b) \$63 350.

(c) \$117.

(d) \$44 500.

(e) heat \$814;

power \$1056;

water \$341

(f) \$37 500

(g) 35 minutes.

(h) superlight poles is 27;

ordinary poles is 45.

(i) 164.

***Self-Test***

1. (a)  $-2 - 8x$

- (b)  $-2x - 9$
- (c)  $-16a - 7$
- (d)  $-6x^2 + 6x + 12$
- 2. (a)  $-7$
- (b)  $18\frac{2}{3}$
- (c)  $0.192$
- (d)  $0.4$
- (e)  $1474$
- (f)  $1450$
- 3. (a)  $-8$
- (b)  $\frac{4}{9}$
- (c)  $1$
- (d)  $2187$
- (e)  $\frac{9}{16}$
- (f)  $-x^{15}$
- 4. (a)  $1.030465$
- (b)  $23.114772$
- (c)  $0.024693$
- (d)  $0.898612$
- (e)  $5.755972$
- (f)  $7.270789$
- 5. (a)  $n = 6$
- (b)  $n = 5$
- 6. (a)  $x = -36$
- (b)  $x = 9$
- (c)  $x = 20$
- (d)  $x = -3$
- (e)  $x = 3$

(f)  $x = 35$

(g)  $x = 25$

(h)  $x = 2$

7. (a)  $P = \frac{I}{rt}$

(b)  $d = \frac{S - P}{St}$

8. (a) \$240.

(b) 4600 square metres.

(c) 55.

(d) \$4500.

**Challenge Problems**

1. The clerk must reduce the total by  $\$0.11x$ .

2. 3200 km.

3. (a) FALSE

(b) TRUE

(c) TRUE

(d) FALSE

(e) FALSE

**Case Study**

1. \$24 211

2. \$24 000

3. (a) \$5529

(b) \$13 566

4. (a) 3.75% of salary

(b) 6.25% of salary