

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. $2f+2f^2+3fg$
25. $9b^4d+2ac^7-3ac$
26. t^2-16
27. $12.25y-2.4$

28. $x^2 - 0.2x + 7$

29. $1.859410k$

30. $2.014036x$

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. $3x^4 + 2x^3 - 16x^2 + 14x - 3$

24. $5b^5 + 5b^4 + 15b^3 + 30b^2 - 10b - 10$

25. $4ab$

26. $-5y$

27. $4x$

28. -6

29. $10m - 4$

30. $-2x + 3$

31. $-2x^2 + 3x + 6$

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

C. 1. -5

2. 14

3. 5500

4. 20 000

5. 0.58604

6. \$40.50

7. \$378

8. 0.125

9. \$3000

10. 0.13

11. \$901.99

12. \$1052.71

13. \$1400.06

14. \$1600.08

15. 3561.780822

16. 250

17. 0.055756

18. 1012.50

19. 0.184

20. 4653.063194

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

23. -11.526683

24. 1

25. 0.781198

26. 116.853901

27. 398.85413

28. 0.105995

29. 69.792598

30. 18.045553

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. \$49 600 000 (C\$149.6 million)
2. C\$133.9 $\times 10^6$
3. C\$2678 $\times 10^6$ million
4. 13.26% 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. $x = 8$
9. $x = 333.\dot{3}$
10. $x =$ all real numbers

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. $x = 2$
 9. $x = 1200.00$
 10. $x = 1500$
- B.
1. $x = 20$
 2. $x = 16$
 3. $x = -1$
 4. $x = 3$
 5. $x = \frac{1}{2}$
 6. $x = -\frac{2}{3}$
 7. $x = -14$
 8. $x = -1$
 9. $x = \frac{109}{126}$

10. $x = \frac{-18}{19}$

C. 1. $x = -1$

2. $x = 2$

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

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

5. $x = \frac{-8}{59}$

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

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

3. $PMT = PVi$

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

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

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

7. $t = \frac{S-P}{Pr}$

8. $d = \frac{L-N}{L}$

9. $i = (1+f)^{\frac{1}{m}} - 1$

10. $n = \frac{\ln\left(\frac{FV}{PV}\right)}{\ln(1+i)}$

Exercise 2.7

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.
17. \$46 780.
18. -6.75
19. 104 on the first shift
52 on the second shift
40 on the third shift
20. 1080 options for each senior manager
21. There are a total of 436 players in the organization.

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) 109.428635

(h) 7.087540

(i) 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. 138.
 10. \$63 350.
 11. \$117.
 12. \$44 500.
 13. heat \$814
 power \$1056
 water \$341
 14. \$37 500
 15. 35 minutes.

16. superlight poles is 27; ordinary poles is 45.
17. 164.
18. \$82.50 per month.
19. Crown Company's stake in Baldwin Industries is worth \$12 Million.

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. \$240.
 9. 4600 square meters.
 10. 55.
 11. \$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