Answers

Chapter 1

1.1 Using Multiples

1. **a)** 10, 20 **b)** 10
2. **a)** 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
b) 4, 8, 12, 16, 20, 24, 28, 32, 36, 40
c) 7, 14, 21, 28, 35, 42, 49, 56, 63, 70
3. 84
4. **a)** 4 **b)** 30 **c)** 40 **d)** 12
e) 24 **f)** 30
5. once
6. 20 days

1.2 A Factoring Experiment

1. **a)** There is a diagonal pattern running down and to the left across the chart. Below each number that has a factor of 3, there are two numbers that do not.
c) 1, 9, and 27
2. **a)** In every other column, every other number is highlighted.
c) 1, 2, 8, 16, 32
3. **a)** 12, 36, 48, 60, 72, 84, and 96 all have both 3 and 4 as factors.
b) $1 \times 24 = 24$, $2 \times 12 = 24$, $3 \times 8 = 24$, $4 \times 6 = 24$, $6 \times 4 = 24$, $8 \times 3 = 24$, $12 \times 2 = 24$, $24 \times 1 = 24$
c) 1, 2, 3, 4, 6, 8, 12, 24

1.3 Factoring

1. **a)** $12 \div 1 = 12$, $12 \div 2 = 6$, $12 \div 3 = 4$, $12 \div 4 = 3$, $12 \div 6 = 2$, $12 \div 12 = 1$
b) When you divide 12 by 5, 7, 8, 9, 10, or 11, you do not get a whole number.
2. **a)** The missing factors are 3 and 9.
b) The factors of 45 are 1, 3, 5, 9, 15, 45.
c) The factors of 50 are 1, 2, 5, 10, 25, 50.
3. **a)** 1, 3, 5, 15
b) 1, 2, 4, 5, 8, 10, 20, 40
c) 1, 2, 3, 6, 9, 18, 27, 54
d) 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72
4. **a)** 5 **b)** 8
5. **a)** 28 **b)** 13 **c)** 15
6. The books can be stacked into equal piles of 1, 7, 11, or 77.

1.4 Exploring Divisibility

1. **a)** no **b)** yes **c)** no **d)** yes
2. **a)** yes **b)** no **c)** no **d)** yes
3. **a)** no **b)** yes **c)** yes **d)** yes
4. **a)** yes **b)** no **c)** yes
5. The chart forms the word "HI."

1.5 Powers

1. **a)** $3^3 = 27$ **b)** $6^2 = 36$ **c)** $2^6 = 64$
d) $10^5 = 100\,000$
2. **a)** $10 \times 10 \times 10 \times 10 = 10\,000$
b) $5 \times 5 \times 5 \times 5 \times 5 = 3125$
c) $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256$
d) $1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1$
3. **a)** true **b)** false: $3^3 = 3 \times 3 \times 3$
c) true **d)** false: $6^3 = 216$
4. **a)** 5^2 **b)** 4^3 **c)** 2^3 **d)** 3^3
5. **a)** 2^4 **b)** 16
6.

Power	Base	Exponent	Meaning	Product
3^2	3	2	3×3	9
2^3	2	3	$2 \times 2 \times 2$	8
6^3	6	3	$6 \times 6 \times 6$	216
4^2	4	2	4×4	16
3^4	3	4	$3 \times 3 \times 3 \times 3$	81

1.6 Square Roots

1. **b)** 9 square units; 3 units; 3
c) 16 square units; 4 units; 4
d) 25 square units; 5 units; 5
2. **a)** 6 **b)** 8 **c)** 7
3. 18 m by 18 m
4. **a)** 21 **b)** 22 **c)** 25 **d)** 32
e) 82 **f)** 41

1.7 Order of Operations

1. **a)** 16 **b)** 40 **c)** 11 **d)** 4
e) 9 **f)** 3 **g)** 10 **h)** 14
i) 21 **j)** 97 **k)** 39 **l)** 13

2. **a)** $(3 + 2) \times 4 = 20$
b) $20 - 6 \times (2 + 1) = 2$
c) $4 \times (2 + 3) + 1 = 21$
d) $4 \times (2 + 3 + 1) = 24$
e) $(4 + 2) \times (3 - 2) = 6$
f) $(7 - 2)^2 + 3 = 28$
g) $(2 + 2 + 2)^2 = 36$
h) $8 - 3 \times (2 - 1) = 5$

3. **a)** 21 **b)** 7 **c)** 2 **d)** 17
e) 5 **f)** 38 **g)** 35 **h)** 8
i) 46 **j)** 25

4. Fawn is correct.

5. (d)

6. (b)

7. **a)** < **b)** > **c)** > **d)** <
e) = **f)** = **g)** < **h)** =

8. **a)** $3 \times 4 + 2 \times 6$
b) 24 articles of clothing

1.8 Solve Problems by Using Power Patterns

1. **a)** The exponent is the same as the number of zeros.
b) 100 zeros

2. 5

3. **a)** 16
b) Square the middle number to find the sum. $5^2 = 25$
c) 81

Test Yourself

1. **a)** 2, 4, 6, 8, 10, 12
b) 8, 16, 24, 32, 40, 48
c) 10, 20, 30, 40, 50, 60
d) 12, 24, 36, 48, 60, 72

2. **a)** yes **b)** no **c)** yes **d)** yes

3. **a)** 30 **b)** 28 **c)** 24 **d)** 20

4. every 21 days

5. **a)** 1, 2, 3, 4, 6, 9, 12, 18, 36
b) 1, 2, 3, 6, 7, 14, 21, 42
c) 1, 2, 4, 17, 34, 68
d) 1, 3, 9, 27, 81

6. **a)** 8 **b)** 1 **c)** 24 **d)** 14

7. **a)** 2 **b)** 7 **c)** 21

8. 2 buses, 1 van

9. **a)** Mr. Singh's garden could be 1 by 36, 2 by 18, 3 by 12, 4 by 9, or 6 by 6. Mrs. Jackson's garden could be 1 by 20, 2 by 10, or 4 by 5.
b) The fence could be 4 m long (the GCF).

10. **a)** yes **b)** yes **c)** no **d)** no
e) yes **f)** no

11. **a)** 32 **b)** 125 **c)** 10 000

12. **a)** 3^3 **b)** 2^7 **c)** 10^6

13. 17 m by 17 m

14. **a)** 10 **b)** 100 **c)** 200 **d)** 3000

15. **a)** 30 **b)** 13 **c)** 21 **d)** 4505

16. **a)** 1 **b)** 8 **c)** 5 **d)** 4

17. **a)** Volume = (5 cm^3) **b)** 125 cm^3

Chapter 2

2.1 Exploring Ratio Relationships

1. **a)** yes **b)** no

2. **b)** 1:2, 3:6, 4:8; They are all similar.

3. **c)** yes **d)** 5:1 **e)** 10:2 **f)** yes

2.2 Solving Ratio Problems

1. **a)** 4:2, 6:3, 8:4
b) 8:1, 16:2, 24:3
c) 9:5, 18:10, 36:20
d) $\frac{20}{6}, \frac{30}{9}, \frac{40}{12}$

2. **a)** 2 **b)** 6 **c)** 6 **d)** 3

3. **a)** 16 shaded squares, 4:6 = 16:24
b) 2 shaded squares, 1:4 = 2:8

4. **a)** 2:3 **b)** 15 pails of earth

5. **a)** 12:6 **b)** 36 years old
c) three times

2.3 Solving Rate Problems

1. **a)** 9 times/3 months; 3 times/month; 6 times/2 months
b) \$32/4 h; \$8/h; \$16/2 h

2. **a)** 14 km/h **b)** 2 h

3. **a)** \$18 **b)** \$108

4. **a)** 36 times/min **b)** 72 times/min
c) 130 times/min

5. **a)** 5 min **b)** 4 min

2.4 Communicating about Ratio and Rate Problems

1. yes

2. **a)** 4 km **b)** no, only 8 km

3. **a)** 20 brownies **b)** 25 brownies

2.5 Ratios as Percents

1. **a)** $\frac{1}{2}$ or $\frac{50}{100}$; 0.50; 50%

b) $\frac{3}{4}$ or $\frac{75}{100}$; 0.75; 75%

c) $\frac{1}{2}$ or $\frac{50}{100}$; 0.50; 50%

d) $\frac{1}{2}$ or $\frac{50}{100}$; 0.50; 50%