

Chapter 1 BLM Answers

BLM 1–2 Chapter 1 Prerequisite Skills

1. **a)** Non-linear. Each increase in the value of r increases the value of A by a different amount
b) Linear. Each increase in the value of x increases the value of y by the same amount, 5.
c) Non-linear. Each increase in the value of the first coordinate increases the value of the second coordinate by a different amount.
d) Linear. The same increase in the value of the first coordinate (2) increases the value of the second coordinate by the same amount, 5.

2. **a)**

| Term Number | Value |
|-------------|-------|
| 1 | 9 |
| 2 | 16 |
| 3 | 23 |
| 4 | 30 |
| 5 | 37 |

b) $v = 7t + 2$ **c)** 499 **d)** $t = 19$

3. **a)**

| Term Number | Value |
|-------------|-------|
| 1 | -4 |
| 2 | -9 |
| 3 | -14 |
| 4 | -19 |
| 5 | -24 |

b) $v = -5t + 1$

Substitute $t = 3$. The result should be -14.

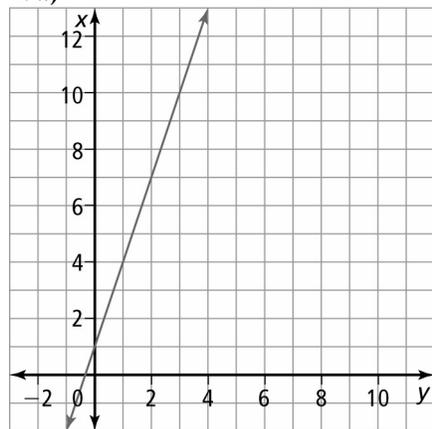
$$v = -5(3) + 1$$

$$v = -15 + 1$$

$$v = -14$$

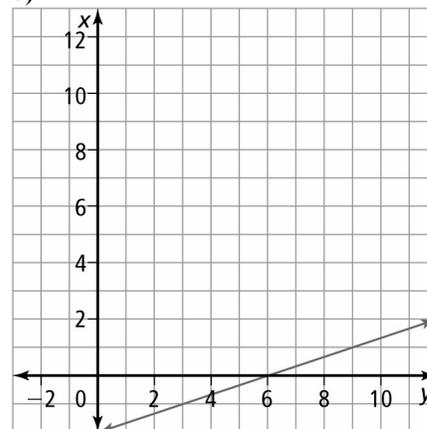
c) -244 **d)** $t = 18$

4. **a)**



$$y = 3x + 1$$

b)



$$y = \frac{1}{3}x - 2$$

5. **a)** $y = -2x + 6$ **b)** $y = -3x - 9$ **c)** $y = -\left(\frac{5}{6}\right)x + \frac{4}{3}$

d) $y = 6x - 4$ **e)** $y = 7x + 9$ **f)** $y = 2x - \frac{3}{4}$

6. **a)** 125 **b)** 1296 **c)** $\frac{1}{16}$ or 0.0625 **d)** $\frac{4}{9}$

7. **a)** -2 **b)** 3 **c)** $\frac{1}{3}$ **d)** $-\frac{2}{3}$

8. **a)** $\frac{1}{12^4}$ **b)** $\frac{t^3}{s^2}$ **c)** $8t^4$ **d)** x^6y^{30}

9. **a)**

| Number of 2-min Intervals | Amount of Protactinium |
|---------------------------|------------------------|
| 0 | 1000 |
| 1 | 500 |
| 2 | 250 |
| 3 | 125 |
| 4 | 62.5 |
| 5 | 31.25 |

b) 12 min

BLM 1–3 Chapter 1 Warm-Up

Section 1.1

1. **a)** The first term is 2. The common difference is 2.

b) The first term is 1. The common difference is 3.

c) The first term is 5. The common difference is 6.

2. **a)** $x = 13$ **b)** $x = -29$

3. **a)** $g(1) = -5$ **b)** $g(0) = -11$ **c)** $g(-3) = -29$

4. **a)** $x = 19\frac{1}{2}$ **b)** $x = 38$



5. a) slope = 4, y-intercept = -1

b)

| x | y |
|---|----|
| 0 | -1 |
| 1 | 3 |
| 2 | 7 |
| 3 | 11 |
| 4 | 15 |
| 5 | 19 |

Section 1.2

1. a) arithmetic sequence, $t_1 = 2, d = 2$

b) not arithmetic sequence

c) arithmetic, $t_1 = 1, d = 3$

d) arithmetic, $t_1 = -6, d = 5$

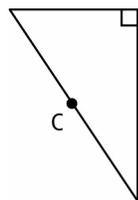
2. a) t_n is the general term, t_1 is the first term, n is the number of terms, and d is the common difference.

b) $t_{26} = 78$ c) $t_1 = -5$ d) $t_n = 2 + 4(n - 1)$

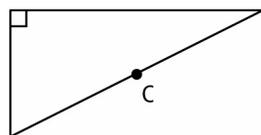
3. a) $y = 6x$ b) $y = 2x + 1$ c) $y = 18 + 36x$

4. $x = -\frac{13}{19}, y = \frac{28}{19}$

5. a)



b)



Section 1.3

1. a) arithmetic, $t_1 = 2, d = 2$

b) not arithmetic because you multiply by 2 to find each successive term

c) arithmetic, $t_1 = 5, d = -2$

d) not arithmetic because you multiply by $\frac{1}{2}$ to find each successive term

2. a) $t_n = 3n - 9$ b) $S_{10} = 75$

3. a) 48 cm \times 38.4 cm b) 15 cm \times 12 cm

4. a) 3.56 b) 1.49 c) 1.51 d) $s = 11.67$

5. a) $r = 27$ b) $r = 51.2$

Section 1.4

1. a) neither b) arithmetic c) geometric

d) geometric e) arithmetic

2. a) $r = -3; -54, 162; t_n = 2(-3)^{n-1}$

b) $r = -\frac{2}{3}; \frac{80}{81}, \frac{-160}{243}; t_n = 5\left(\frac{-2}{3}\right)^{n-1}$

3. Solve $2(7)^{n-1} = 4802$ to get $n = 5$.

4. a) $r = 5$ b) $r = \frac{1}{6}$

5. $t_1 = 7, r = 4, t_n = 7(4)^{n-1}$

Section 1.5

1. a) arithmetic, $S_{18} = -\frac{45}{2}$ or -22.5

b) geometric, $S_{18} = 6.0$ c) arithmetic, $S_{18} = 639$

d) geometric, $S_{18} = 3\ 145\ 716$

2. a) $t_1 = 1, r = -\frac{1}{3}$ and $n = 11$

b) $t_n = 1\left(-\frac{1}{3}\right)^{n-1}$ c) $S_{11} = 0.75$

3. a) 6, 3, $\frac{3}{2}, \frac{3}{4}, \frac{3}{8}$

b) The length from A to G would be $\frac{3}{16}$ cm or 0.1875 cm.

4. a) 0.2 b) 0.23 c) 0.047

5. a) $\frac{27}{25}$ b) $-\frac{343}{540}$

6. a) 0.06 b) 0.02 c) 0.00

BLM 1–4 Section 1.1 Extra Practice

1. a) arithmetic; $t_1 = 4, d = 3; 16, 19, 22$

b) arithmetic; $t_1 = 12, d = -5; -8, -13, -18$

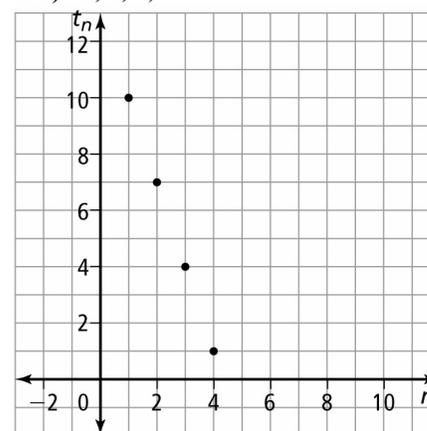
c) not arithmetic d) not arithmetic

e) arithmetic; $t_1 = x, d = 2; x + 8, x + 10, x + 12$

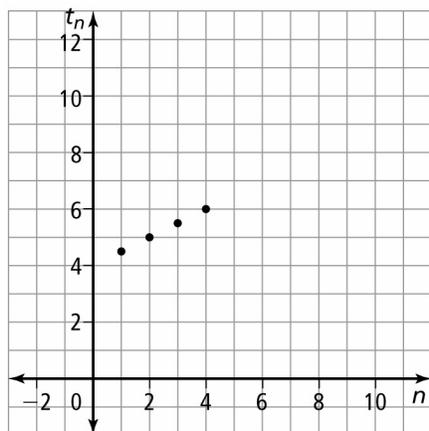
2. a) -5, -7, -9, -11 b) 10, 9.5, 9, 8.5

c) 3, 3 + x, 3 + 2x, 3 + 3x d) $\frac{7}{3}, \frac{8}{3}, \frac{9}{3}, \frac{10}{3}$

3. a) 10, 7, 4, 1



b) $4\frac{1}{2}, 5, 5\frac{1}{2}, 6$



4. a) $t_n = 4n + 2; t_{50} = 202$ b) $t_n = \frac{7}{2} - \frac{1}{2}n;$

$t_{50} = -21\frac{1}{2}$

5. a) 77 b) 26

6. a) 4, $\boxed{8}$, $\boxed{12}$, 16 b) $\boxed{10}$, 8, $\boxed{6}$, $\boxed{4}$, 2

c) 20, $\boxed{14}$, $\boxed{8}$, $\boxed{2}$, $\boxed{-4}$, -10

7. $t_1 = 12, t_n = 5n + 7, t_{40} = 207$

8. a) $t_1 = -15, d = 4, t_n = 4n - 19$

b) $t_1 = 93, d = -3, t_n = 96 - 3n$

9. $x = \frac{10}{3}; \frac{25}{3}, 8, \frac{23}{3}$

10. a) 15, 18 b) $t_n = 3n + 3$

c) 63 asterisks d) 41st diagram

BLM 1-5 Section 1.2 Extra Practice

1. a) -936 b) 232.5 c) 252.5 or $252\frac{1}{2}$

2. a) 378 b) 0 c) $400x$

3. a) 15 b) 25 c) 21

4. a) $t_{12} = -41, S_{12} = -228$ b) $t_{12} = \frac{47}{5}, S_{12} = 60$

5. a) 413 b) $95\sqrt{3}$

6. 71 071 7. 2850 8. $t_1 = 8, t_9 = 40$

9. a) $S_1 = 7, S_2 = 20, S_3 = 39, S_4 = 64, S_5 = 95$

b) $t_1 = 7, t_2 = 13, t_3 = 19, t_4 = 25, t_5 = 31$

c) $S_5 = 3(5)^2 + 4(5) = 95$

10. $6 + 11 + 16 + \dots + t_{20} = \1070 . Therefore, the arithmetic series method pays more money.

BLM 1-6 Section 1.3 Extra Practice

1. a) geometric, $r = 3, t_n = 11(3)^{n-1}$

b) not geometric c) geometric, $r = 2, t_n = \frac{1}{3}(2)^{n-1}$

d) geometric, $r = 0.4, t_n = (0.5)(0.4)^{n-1}$

2. a) 7, -21, 63, -189

b) -8, -4, -2, -1

c) 3, 1.8, 1.08, 0.648

d) -4, 16, -64, 256

3. a) 10 b) 14 c) 7 d) 12

4. a) $t_n = 2(7)^{n-1}$ b) $t_n = 6(-3)^{n-1}$

c) $t_n = 7(4)^{n-1}$ d) $t_n = 4096\left(\frac{1}{4}\right)^{n-1}$

5. a) 126, 882 b) $\frac{4}{3}, 12, 36$ c) $\pm 10, 20, \pm 40$

6. 4

7. a) $t_1 = 9 \times 10^{10}, r = \pm 0.01,$

$t_n = (9 \times 10^{10})(\pm 0.01)^{n-1}$

b) $t_1 = -48, r = -6, t_n = (-48)(-6)^{n-1}$

c) $t_1 = 1.75, r = \pm 2, t_n = (1.75)(\pm 2)^{n-1}$

d) $t_1 = \pm 6, r = \pm 0.5, t_n = (6)(\pm 0.5)^{n-1}$

8. a) $x = 2$ b) $y = \frac{6}{10}$ or $\frac{3}{5}$

9. 384

10. a) \$211 200, \$185 856, \$163 553

b) $t_n = 240\,000(0.88)^{n-1}$, t_n = value of digger, in dollars, $n - 1$ = years since purchase

c) \$98 082 d) 6 years

BLM 1-7 Section 1.4 Extra Practice

1. a) geometric series, the common ratio is 1.2

b) geometric series, the common ratio is -0.2

c) geometric series, the common ratio is $\frac{2}{3}$

d) not geometric, no common ratio

2. a) $t_1 = 0.43, r = 0.01, S_6 = \frac{43}{99}$

b) $t_1 = 5, r = -1, S_{10} = 0$

c) $t_1 = -100, r = -0.5, S_7 = \frac{-1075}{16}$

3. a) 232.05 b) -4092 c) $\frac{-155}{16}$ d) 12 285

4. a) 531 440 b) 4095 c) $\frac{3367}{128}$

5. a) 1.2 b) 3

6. a) 6 b) 9

7. 1916.25 8. 4

9. a) 10, 30, 90, 270 b) 12, 6, 3, 1.5

10. 94.2 m

BLM 1-8 Section 1.5 Extra Practice

1. a) convergent b) convergent c) convergent

d) divergent

2. a) -20 b) 6 c) does not exist d) $\frac{5}{4}$ e) 24 f) $-\frac{8}{7}$



3. a) $\frac{63}{100} + \frac{63}{(100)^2} + \frac{63}{(100)^3} + \dots = \frac{7}{11}$
 b) $7.4 + \frac{5}{100} + \frac{5}{1000} + \frac{5}{10\,000} + \dots = 7\frac{41}{90}$
 c) $0.123 + \frac{456}{(1000)^2} + \frac{456}{(1000)^3} + \frac{456}{(1000)^4} + \dots = \frac{41\,111}{333\,000}$
 4. $\frac{21}{2}$ 5. $-\frac{1}{2}$ 6. $\frac{3}{4}\pi$ 7. 14 m 8. $|x| < 1$
 9. $\frac{2}{3}$ 10. a) 125 761 m³ b) 480 000 m³

BLM 1–9 Chapter 1 Test

1. B 2. C 3. B 4. D 5. B
 6. There are 33 lockers.
 7. Brittany travelled 1752 m.
 8. 20 358
 9. a) $d = 6$ b) $t_1 = 4$ c) $t_{100} = 598$
 10. a) $r = 9$ or -9 b) $t_n = 5(9)^{n-1}$ or $t_n = 5(-9)^{n-1}$
 11. a) $-3, -12, -48$
 b) The sequence is geometric. $t_n = -3(4)^{n-1}$
 12. a) Example, for the series $2 + 10 + 50 + \dots$, $S_{10} = 4\,882\,812$.
 b) Answers will vary. Students need to change the sign of the first term, while leaving the common ratio unchanged. In the example above, the series becomes $-2 - 10 - 50 - \dots$, $S_{10} = -4\,882\,812$.
 c) Answers will vary. Correct answers must have positive first term and negative common ratio. For example, $2 - 10 + 50 - \dots$
 13. a) 6979, 7537, 8140 b) $t_n = 6462(1.08)^{n-1}$
 c) 27 888
 d) Answers will vary. For example, we assume that population continues to grow at the same rate.
 14. Answers will vary, however will all be in the form k, k, k, \dots , where k is a real number.
 a) Note that $d = 0$, so $t_n = k$.
 b) Note that $r = 1$, so $t_n = k$.
 c) There are infinitely many such sequences, but all sequences will have the same form.

