

# Pre-Calculus 11: 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.

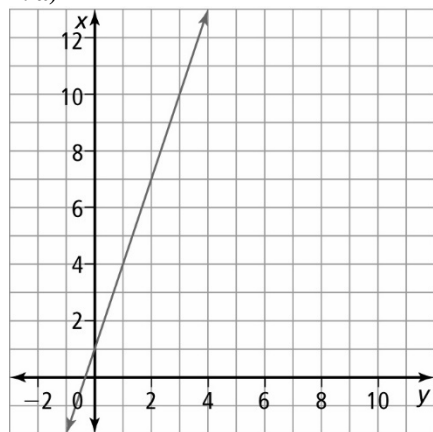
$$v = -5(3) + 1$$

$$v = -15 + 1$$

$$v = -14$$

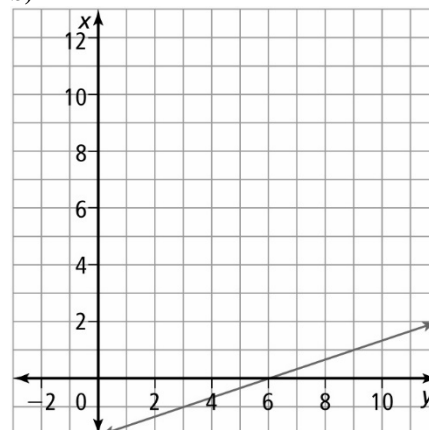
c) -244 d)  $t = 18$

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)

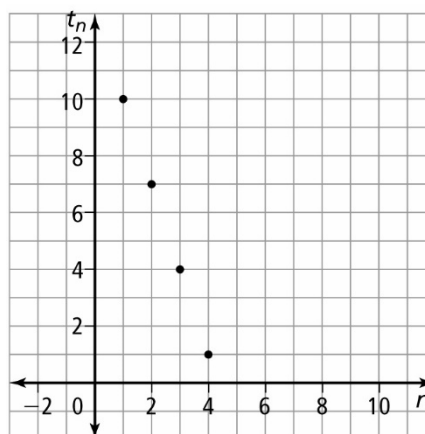
Number of 2-min Intervals	Amount of Protactinium
0	1000
1	500
2	250
3	125
4	62.5
5	31.25

b) 12 min

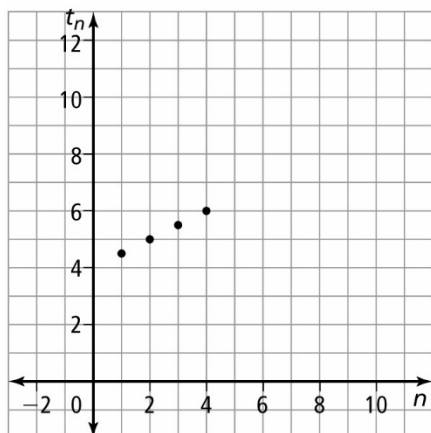


**BLM 1-4 Section 1.1 Extra Practice**

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 m<sup>3</sup> b) 480 000 m<sup>3</sup>

