Exercise 1

2. $\{(1,3), (2,6), (3,12), (4,24), \ldots\}$

y-values: 3, 6, 12, 24   x-values: increase
                                          by 1.
             ×2 ×2 ×2

This is an exponential function with a
common ratio of 2.

4. $\{(1,3), (3,1.5), (5,0.75), (7,0.375), \ldots\}$

y-values: 3, 1.5, 0.75, 0.375   x-values:
                                          increase by 2
         ×$\frac{1}{2}$ ×$\frac{1}{2}$ ×$\frac{1}{2}$

* $\div 2 = \times \frac{1}{2}$

This is an exponential function with a
common ratio of $\sqrt{\frac{1}{2}}$. $\{$since the x-values increase by 2.$\}$

7. $\{(2,8), (5,12), (8,18), (11,27),...\}$

y-values: 8, 12, 18, 27

×1.5 ×1.5 ×1.5

This is an exponential function with a common ratio of $\sqrt[3]{1.5}$ or $\sqrt[3]{\frac{3}{2}}$.

{ Since the x-values increase by 3 }

9. $\{(-1, 40), (0, 8), (1, 1.6), (2, 0.32), \ldots\}$

y-values: 40, 8, 1.6, 0.32)   x-values:
                                 increase by 1.
              ×0.2 ×0.2 ×0.2

This is an exponential function with a
common ratio of 0.2.

10. $\{5, 15, 45, 135, 405, 1215\}$ common ratio is 3.

$\times 3 \quad \times 3 \quad \times 3 \quad \times 3 \quad \times 3$

11. $\{-4, 16, -64, 256, -1024, 4096\}$ common ratio is -4

$\times -4 \quad \times -4 \quad \times -4 \quad \times -4 \quad \times -4$

12. $\left\{\dfrac{5}{7}, \dfrac{5}{14}, \dfrac{5}{28}, \dfrac{5}{56}, \dfrac{5}{112}, \dfrac{5}{224}\right\}$ common ratio is $\dfrac{1}{2}$

14. $y = 4^x$

Common ratio = 4

15. $y = 1.8^x$

Common ratio = 1.8

16. $y = 0.3^x$

Common ratio = 0.3 .

17. $y = 2700(0.6)^x$

Common ratio = 0.6 .

18. Joe borrows $250 from Tom
    Tom charges 2% interest per day.
  * (At the end of 1 day, he will owe 102%).
    EQUATION:
      $y =$ initial amount $(\text{common ratio})^x$
      $y = \$250 (1.02)^x$

After 5 days: $y = \$250 (1.02)^5$
                 $= \$250 (1.104080803)$
                 $= \$276.02$

After 20 days: $y = \$250 (1.02)^{20}$
                 $= \$250 (1.485947396)$
                 $= \$371.49$

After 100 days: $y = \$250 (1.02)^{100}$
                 $= \$250 (7.244646118)$
                 $= \$1811.16$

This function is an example of exponential growth!

19. Samantha buys a car for $ 24000
    The vehicle depreciates by 18% each year.

a)

Time (x)	0	1	2	3	4
Amount (y)	24000	19680	16137.60	13232.83	10850.92

b) Common Ratio = 0.82
   (100% - 18% = 82%)

c) This function is an example of
   exponential decay.

d) EQUATION : $y = 24000(0.82)^x$

Initial Amount   Common Ratio