Exercise 1

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

y-values: 3, 6, 12, 24   x-values: increase by 1.
$\times 2 \ \times 2 \ \times 2$

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
$\times \frac{1}{2} \ \times \frac{1}{2} \ \times \frac{1}{2}$

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

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

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

y-values: 8, 12, 18, 27
$\times 1.5 \ \times 1.5 \ \times 1.5$

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}

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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.
$\times 0.2 \ \times 0.2 \ \times 0.2$

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

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

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

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

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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. $y = 2700(2.6)^x$

Common ratio = 2.6.

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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!

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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

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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%)