

Name: _____
SP Graphing Exponentials

Date: _____

1. Graph $y = -2 \cdot 2^x - 4$

$a = \underline{-2}$

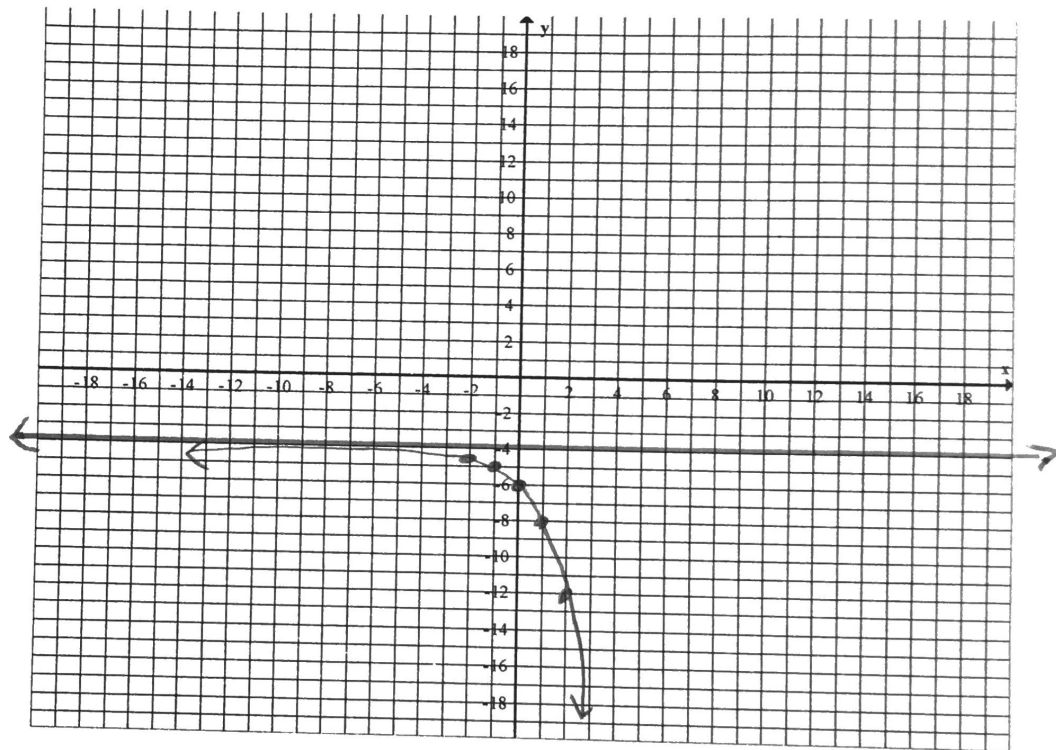
$b = \underline{2}$

$h = \underline{0}$

$k = \underline{-4}$

Transformations:

- reflection over x-axis
- vertical stretch of 2
- down 4



Parent:

| x | y |
|----|-----|
| -2 | 1/4 |
| -1 | 1/2 |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |

Transformation:

| x | -2y-4 |
|----|-------|
| -2 | -4.5 |
| -1 | -5 |
| 0 | -6 |
| 1 | -8 |
| 2 | -12 |

Domain: $(-\infty, \infty)$

Range: $(-\infty, -4)$

Asymptote: $y = -4$

~~Intercepts:~~

$x \rightarrow -\infty, f(x) \rightarrow -4$

~~Zeros:~~

$x \rightarrow \infty, f(x) \rightarrow -\infty$

Interval of Increase/Decrease: $(-\infty, \infty)$

2. Graph $y = \left(\frac{1}{2}\right)^{x-2} - 1$

$a = \frac{1}{1}$

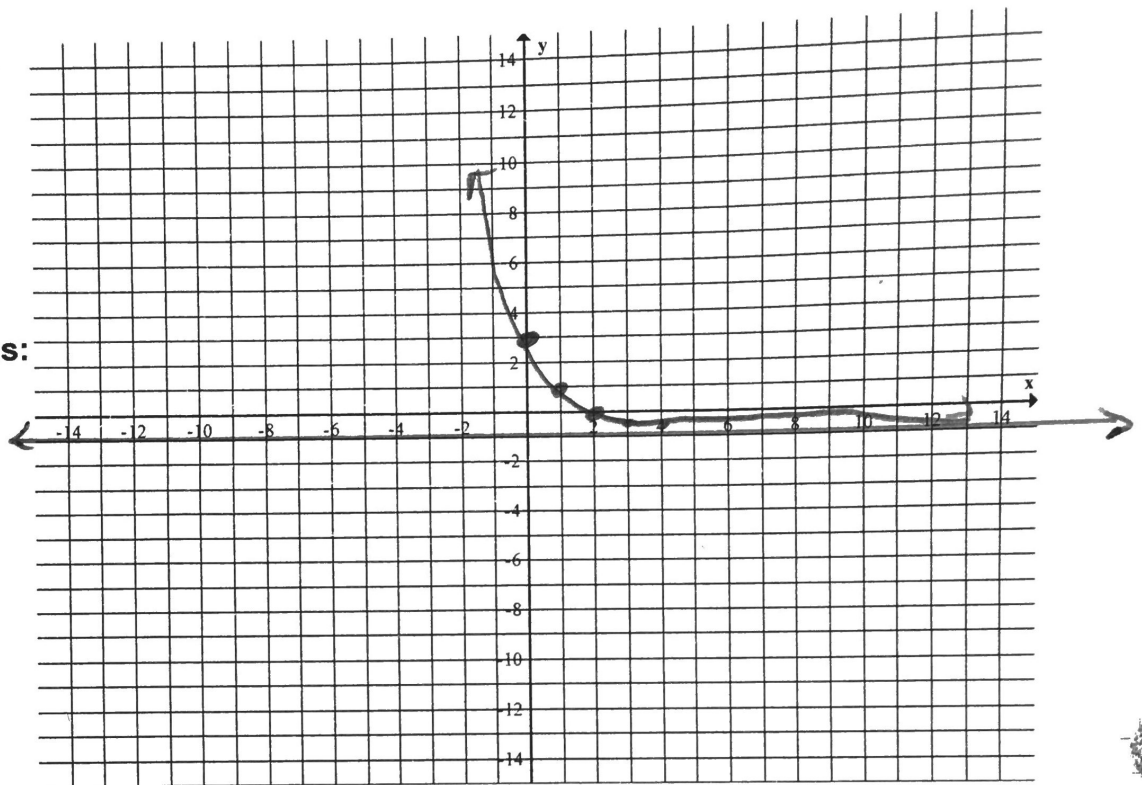
$b = \frac{1}{2}$

$h = 2$

$k = -1$

Transformations:

- right 2
- down 1



Parent:

| x | y |
|----|-----|
| -2 | 4 |
| -1 | 2 |
| 0 | 1 |
| 1 | 1/2 |
| 2 | 1/4 |

Transformation:

| $x+2$ | $y-1$ |
|-------|-------|
| 0 | 3 |
| 1 | 1 |
| 2 | 0 |
| 3 | -0.5 |
| 4 | -0.75 |

Domain: $(-\infty, \infty)$

Range: $(-1, \infty)$

Asymptote: $y = -1$

~~Intercepts:~~ $x \rightarrow -\infty, f(x) \rightarrow \infty$

~~Zeros:~~ $x \rightarrow \infty, f(x) \rightarrow -1$

Intervals of Increase/Decrease: $(-\infty, \infty)$

3. Graph $y = 3 \cdot 2^{(-x-1)} + 4$

$a = \underline{3}$

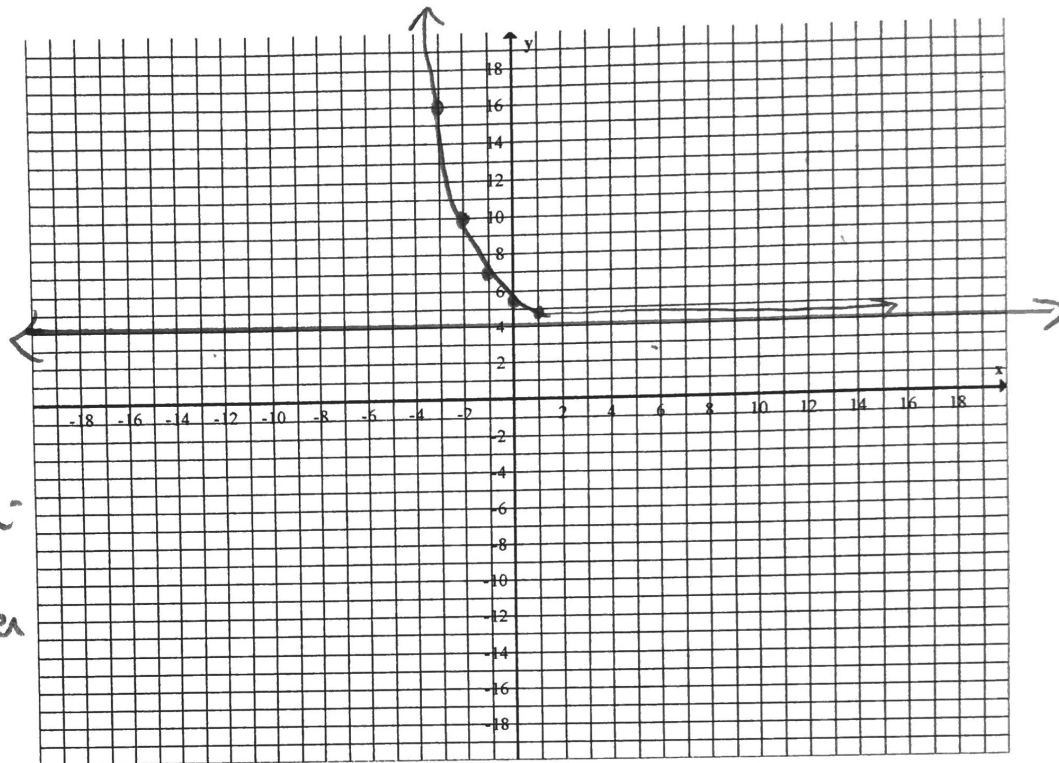
$b = \underline{2}$

$h = \underline{-1}$

$k = \underline{4}$

Transformations:

- vertical stretch of 3
- reflection over y-axis
- left 1
- up 4



Parent:

| x | y |
|----|-----|
| -2 | 1/4 |
| -1 | 1/2 |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |

Transformation:

| $-x-1$ | $3y+4$ |
|--------|--------|
| 1 | 4.75 |
| 0 | 5.5 |
| -1 | 7 |
| -2 | 10 |
| -3 | 16 |

Domain: $(-\infty, \infty)$

Range: $(4, \infty)$

Asymptote: $y = 4$

Intercepts: $x \rightarrow -\infty, f(x) \rightarrow \infty$
 $x \rightarrow \infty, f(x) \rightarrow 4$

Zeros:

Interval of Increase/Decrease: $(-\infty, \infty)$

4. Graph $y = -2 \cdot \left(\frac{1}{4}\right)^{-x+4} + 3$

$a = \underline{-2}$

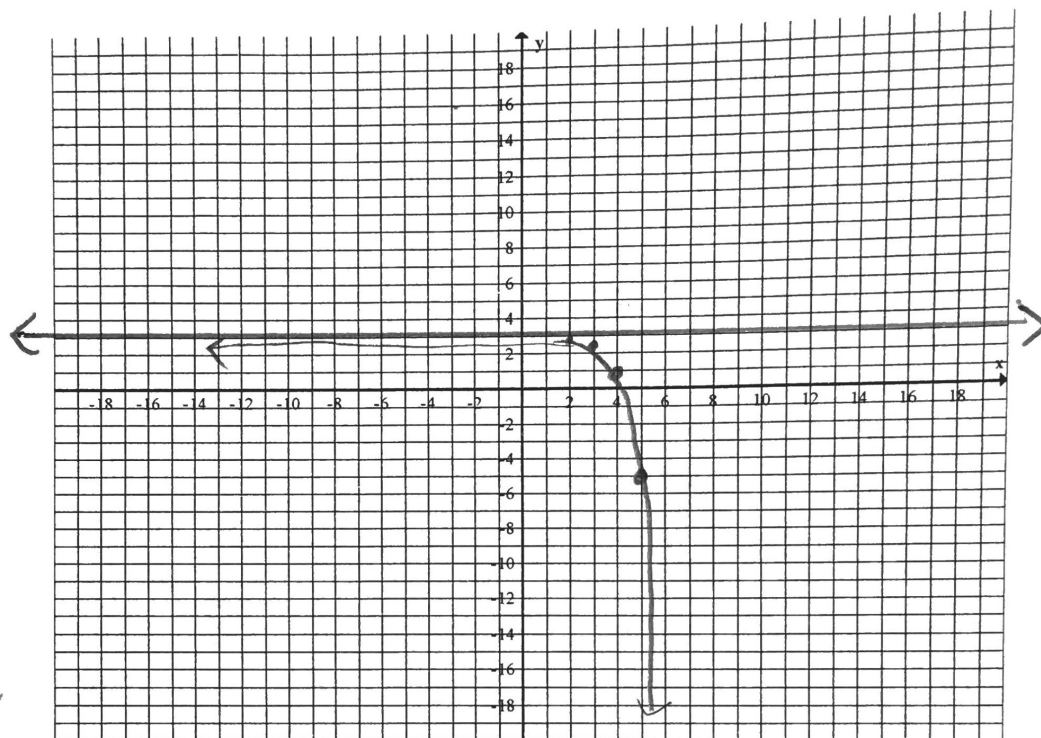
$b = \underline{1/4}$

$h = \underline{4}$

$k = \underline{3}$

Transformations:

- reflection over x-axis
- vertical stretch of 2
- reflection over y-axis
- right 4
- up 3



Parent:

| x | y |
|----|------|
| -2 | 1/6 |
| -1 | 1/4 |
| 0 | 1 |
| 1 | 1/4 |
| 2 | 1/16 |

Transformation:

| $-x+4$ | $-2y+3$ |
|--------|---------|
| 6 | -29 |
| 5 | -5 |
| 4 | 1 |
| 3 | 2.5 |
| 2 | 2.875 |

Domain: $(-\infty, \infty)$

Range: $(-\infty, 3)$

Asymptote: $y = 3$

Intercepts: $x \rightarrow -\infty, f(x) \rightarrow 3$
 $x \rightarrow \infty, f(x) \rightarrow -\infty$

Zeros:

Interval of Increase/Decrease: $(-\infty, \infty)$

5. Graph $y = 3^{(-x+3)} - 5$

$a = \underline{1}$

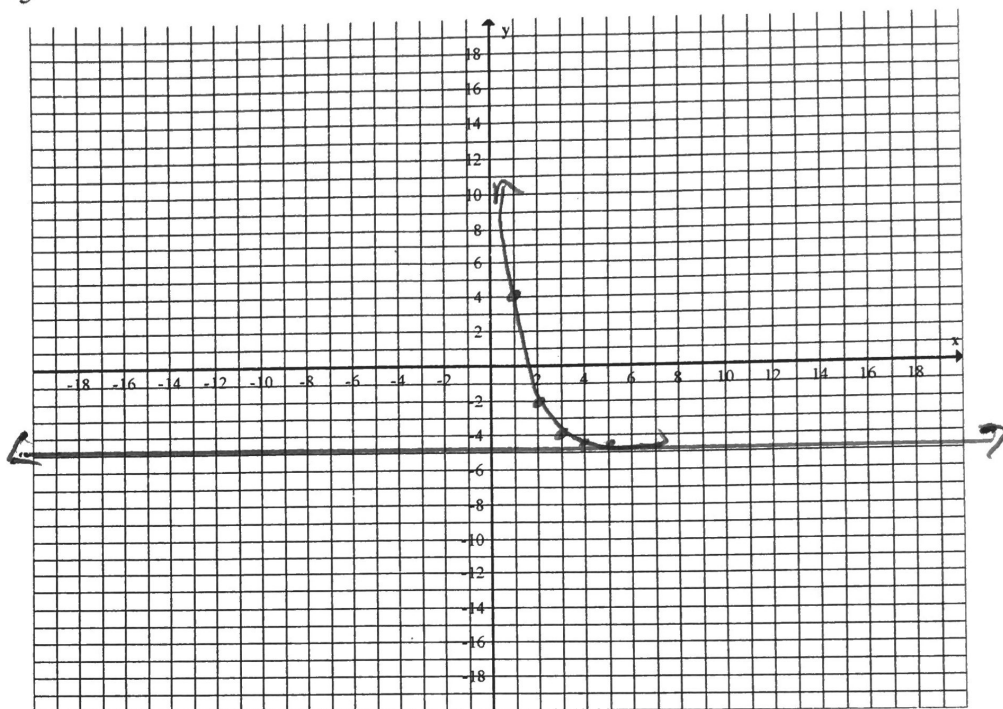
$b = \underline{3}$

$h = \underline{3}$

$k = \underline{-5}$

Transformations:

- reflection over y-axis
- right 3
- down 5



Parent:

| x | y |
|----|-----|
| -2 | 1/9 |
| -1 | 1/3 |
| 0 | 1 |
| 1 | 3 |
| 2 | 9 |

Transformation:

| $-x+3$ | $y-5$ |
|--------|-------|
| 5 | -4.99 |
| 4 | -4.67 |
| 3 | -4 |
| 2 | -3 |
| 1 | -2 |

Domain: $(-\infty, \infty)$

Range: $(-5, \infty)$

Asymptote: $y = -5$

~~Intercepts~~ $x \rightarrow -\infty, f(x) \rightarrow \infty$

~~Zeros~~ $x \rightarrow \infty, f(x) \rightarrow -5$

Interval of Increase/Decrease: $(-\infty, \infty)$

6. Graph $y = \frac{1}{4}(7)^x - 6$

$a = \frac{1}{4}$

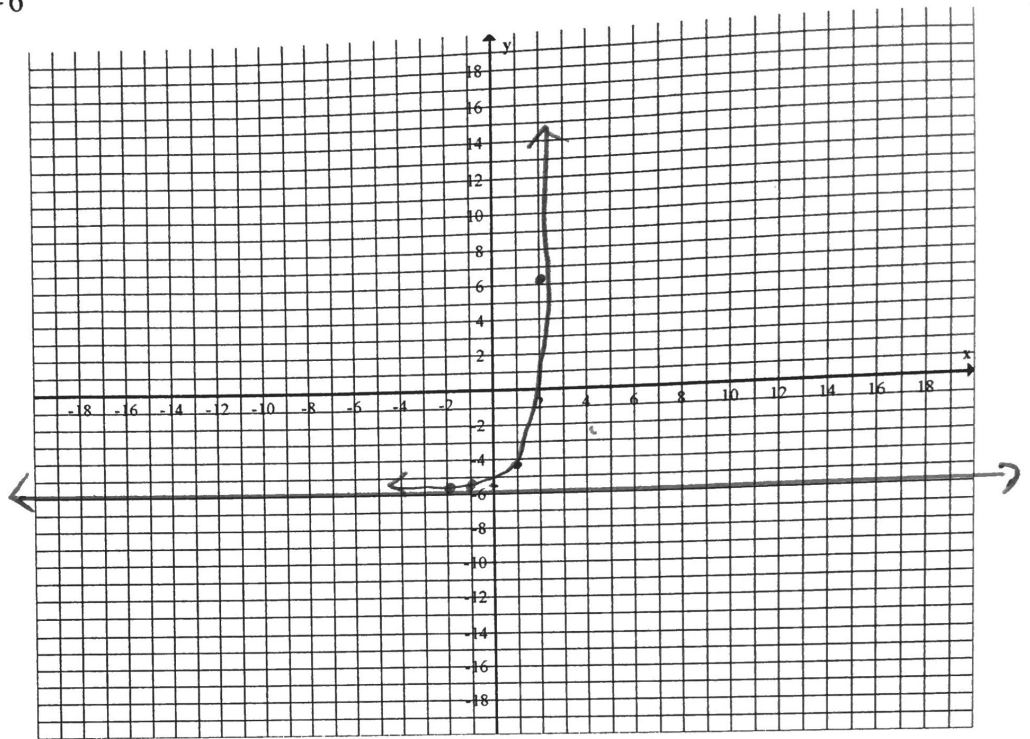
$b = 7$

$h = 0$

$k = -6$

Transformations:

- vertical shrink of $1/4$
- down 6



Parent:

| x | y |
|----|------|
| -2 | 1/49 |
| -1 | 1/7 |
| 0 | 1 |
| 1 | 7 |
| 2 | 49 |

Transformation:

| x | $y = \frac{1}{4}(7)^x - 6$ |
|----|----------------------------|
| -2 | -5.99 |
| -1 | -5.96 |
| 0 | -5.75 |
| 1 | -4.25 |
| 2 | 6.25 |

Domain: $(-\infty, \infty)$

Range: $(-6, \infty)$

Asymptote: $y = -6$

~~Intercepts:~~

$x \rightarrow -\infty, f(x) \rightarrow -6$

~~Zeros:~~

$x \rightarrow \infty, f(x) \rightarrow \infty$

Interval of Increase/Decrease: $(-\infty, \infty)$

7. Graph $y = -4 \cdot \left(\frac{1}{3}\right)^{-x+2} + 10$

$a = \underline{-4}$

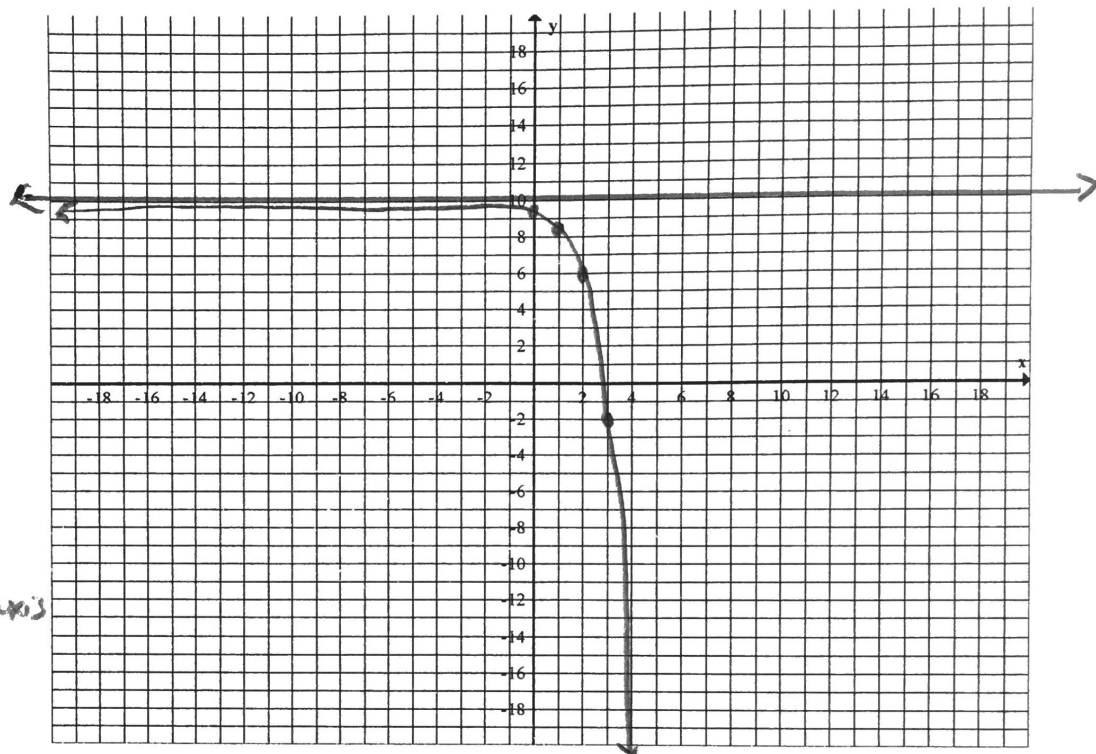
$b = \underline{1/3}$

$h = \underline{2}$

$k = \underline{10}$

Transformations:

- reflection over x-axis
- reflection over y-axis
- right 2
- up 10



Parent:

| x | y |
|----|-----|
| -2 | 9 |
| -1 | 3 |
| 0 | 1 |
| 1 | 1/3 |
| 2 | 1/9 |

Transformation:

| $-x+2$ | $-4y+10$ |
|--------|----------|
| 4 | -26 |
| 3 | -2 |
| 2 | 6 |
| 1 | 8.67 |
| 0 | 9.56 |

Domain: $(-\infty, \infty)$

Range: $(-\infty, 10)$

Asymptote: $y = 10$

Intercepts:

$x \rightarrow -\infty, f(x) \rightarrow 10$

Zeros:

$x \rightarrow \infty, f(x) \rightarrow -\infty$

Interval of Increase/Decrease: $(-\infty, \infty)$

Interval of Increase/Decrease: $(-\infty, \infty)$

Zeros: $X \rightarrow \infty, f(x) \rightarrow 8$
 Intercepts: $X \rightarrow -\infty, f(x) \rightarrow \infty$

Asymptote: $y = 8$

Range: $(-\infty, 8)$

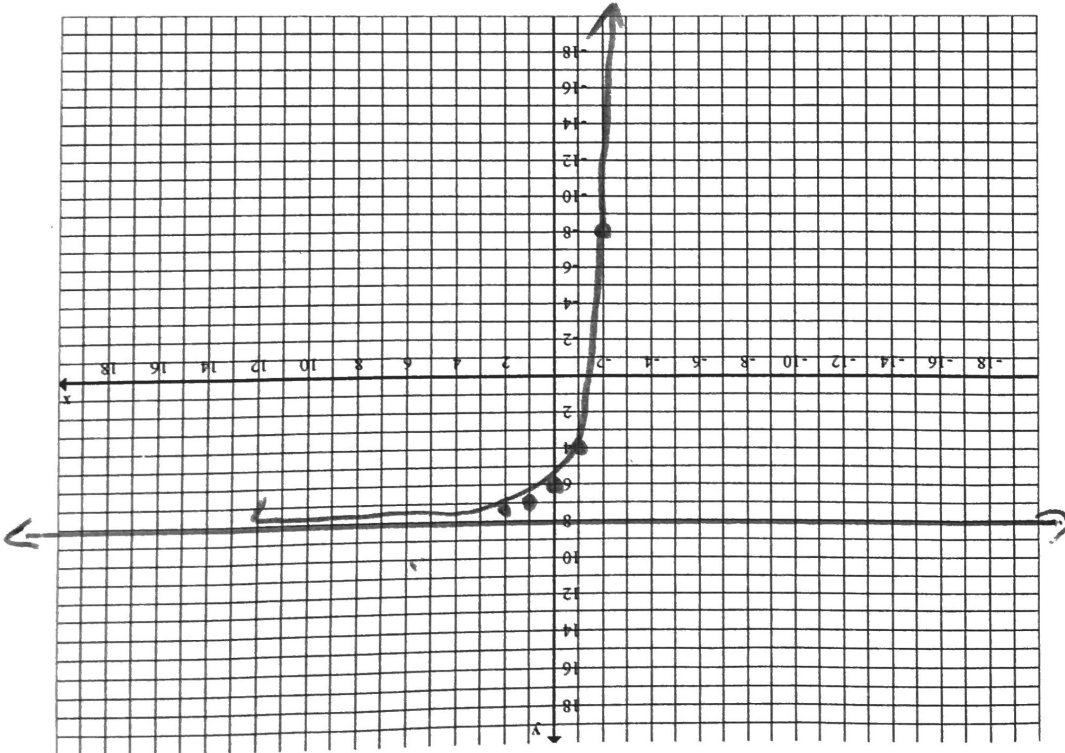
Domain: $(-\infty, \infty)$

| | | | | | |
|--------|------|------|-----|-----|-------|
| x | -2 | -1 | 0 | 1 | 2 |
| $f(x)$ | -8 | -4 | 0 | 4 | 7.5 |

Transformation:

| | | | | | |
|-----|------|------|------|-------|-------|
| x | -2 | -1 | 0 | 1 | 2 |
| y | 4 | 0 | -1 | $1/2$ | $1/4$ |

Parent:



• reflection over x-axis
 • vertical stretch of 2
 • up 8

Transformations:

$$a = \frac{-2}{1/2}$$

$$h = \frac{0}{1}$$

$$k = \frac{8}{1}$$

8. Graph $y = -2 \cdot \left(\frac{1}{2}\right)^x + 8$