1.

a) Function Family: Quadratic

b) Equation of Parent Function: $y = x^2$

c) Vertical translation: 2 units up or down

d) Horizontal translation: 3 units left or right

e) Reflection over *x*-axis or *y*-axis? NO

f) Equation of Function: $f(x) = (x+3)^2 - 2$

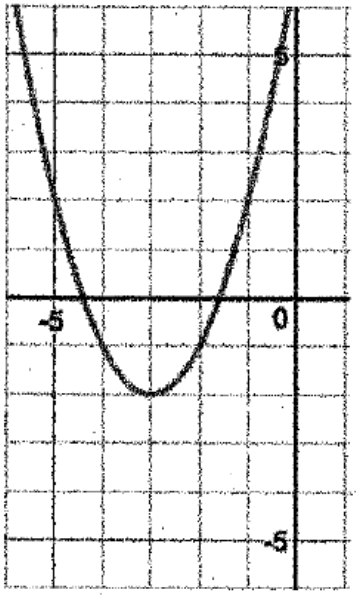
g) Domain: $x \in \mathbb{R}$

h) Range: $y \geq -2$

i) End behavior:

As $x \to \infty$, $f(x) \to \infty$

As $x \to -\infty$, $f(x) \to \infty$



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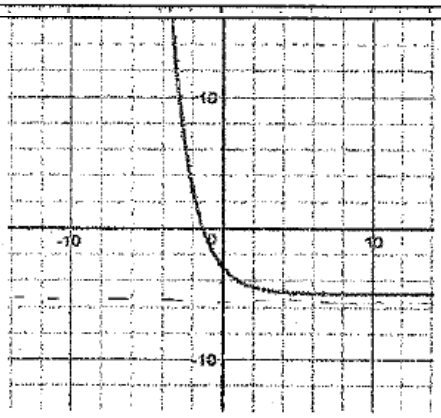


a) Function Family: exponential

b) Equation of Parent Function: $f(x) = 2\left(\frac{1}{4}\right)^x$

c) Vertical translation: 5 units up or down

d) Horizontal translation: 0 units left or right

e) Reflection over *x*-axis or *y*-axis? NO

f) Equation of Function: $f(x) = 2\left(\frac{1}{4}\right)^x - 5$

g) Domain: $x \in \mathbb{R}$

h) Range: $y > -5$

i) End behavior:

as $x \to \infty$, $y \to -5$

as $x \to -\infty$, $y \to \infty$

3.

a) Function Family: linear

b) Equation of Parent Function: $y = x$

c) Equation of Function: $f(x) = -2x + 4$

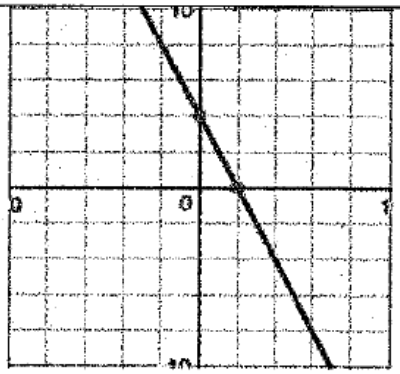
d) Domain: $x \in \mathbb{R}$

e) Range: $y \in \mathbb{R}$

f) End behavior:

as $x \to \infty$, $y \to -\infty$

as $x \to -\infty$, $y \to \infty$



8. The admission rates for an amusement park are as follows:

- Children 5 years old and under - FREE
- Children between 5 years and 12 years - $10
- Children between 12 years and 18 years - $25
- Adults (18 years and above) - $35

Write a piecewise function that gives the admission price for a given age.

speed

$$f(x) = \begin{cases} 0, & 0 \le x \le 5 \\ 10, & 5 < x \le 12 \\ 25, & 12 < x \le 18 \\ 35, & x > 18 \end{cases}$$

9. Write a piecewise function that describes the situation.
For a cellular data plan, $50 per month buys 400 minutes. Additional time cost $0.30 per minute. Let the monthly cost C(x) be the function of the time x.

$$C(x) = \begin{cases} 50, & 0 \le x \le 400 \\ 50 + .3(x - 400), & x > 400 \end{cases}$$

10. For the following function, $f(x) = \begin{cases} x^2 - 1, & x \le 0 \\ 2x - 1, & 0 < x \le 5 \\ 3, & x > 5 \end{cases}$

Evaluate f(-2) + f(0) – f(5).

$f(-2) = (-2)^2 - 1 = 4 - 1 = 3$
$f(0) = (0)^2 - 1 = 0 - 1 = -1$
$f(5) = 2(5) - 1 = 10 - 1 = 9$

$f(-2) + f(0) - f(5)$
$3 + (-1) - 9$
$\boxed{-7}$

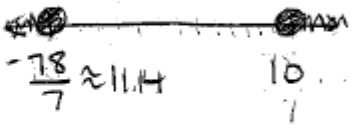
11. Solve each inequality and graph it's solution on a number line.

a) $|7x+4| \geq 74$

$7x+4 \geq 74$ $\quad$ $7x+4 \leq -74$

$7x \geq 70$ $\quad$ $7x \leq -78$

$x \geq 10$ $\quad$ $x \leq \frac{-78}{7}$



b) $\frac{|2+3x|}{2} \geq 5$

$|2+3x| \geq 10$

$2+3x \geq 10$ $\quad$ $2+3x \leq -10$

$3x \geq 8$ $\quad$ $3x \leq -12$

$x \geq \frac{8}{3}$ $\quad$ $x \leq -4$

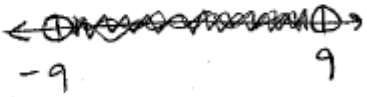
c) $7\left|\frac{x}{3}\right| - 9 < 12$

$7\left|\frac{x}{3}\right| < 21$

$\left|\frac{x}{3}\right| < 3$

$\frac{x}{3} < 3$ $\quad$ $\frac{x}{3} > -3$

$x < 9$ $\quad$ $x > -9$



12. Match the following piecewise functions to their graphs.

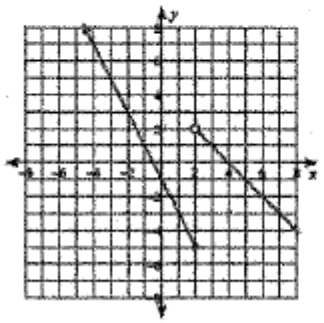
Function A = Graph 3 Function B = Graph 1 Function C = Graph 2

A $f(x) = \begin{cases} -6, & x < -2 \\ (x+1)^4, & x \geq -2 \end{cases}$

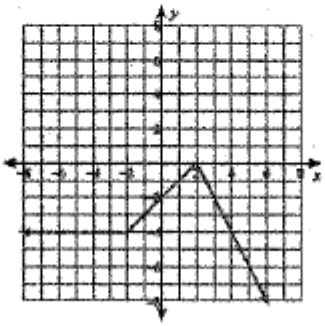
B $f(x) = \begin{cases} -2x-1, & x \leq 2 \\ -x+4, & x > 2 \end{cases}$

C $f(x) = \begin{cases} -4, & x \leq -2 \\ x-2, & -2 < x < 2 \\ -2x+4, & x \geq 2 \end{cases}$

1



2



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