

1. $f(x) = 2215(x-1) + 62736$

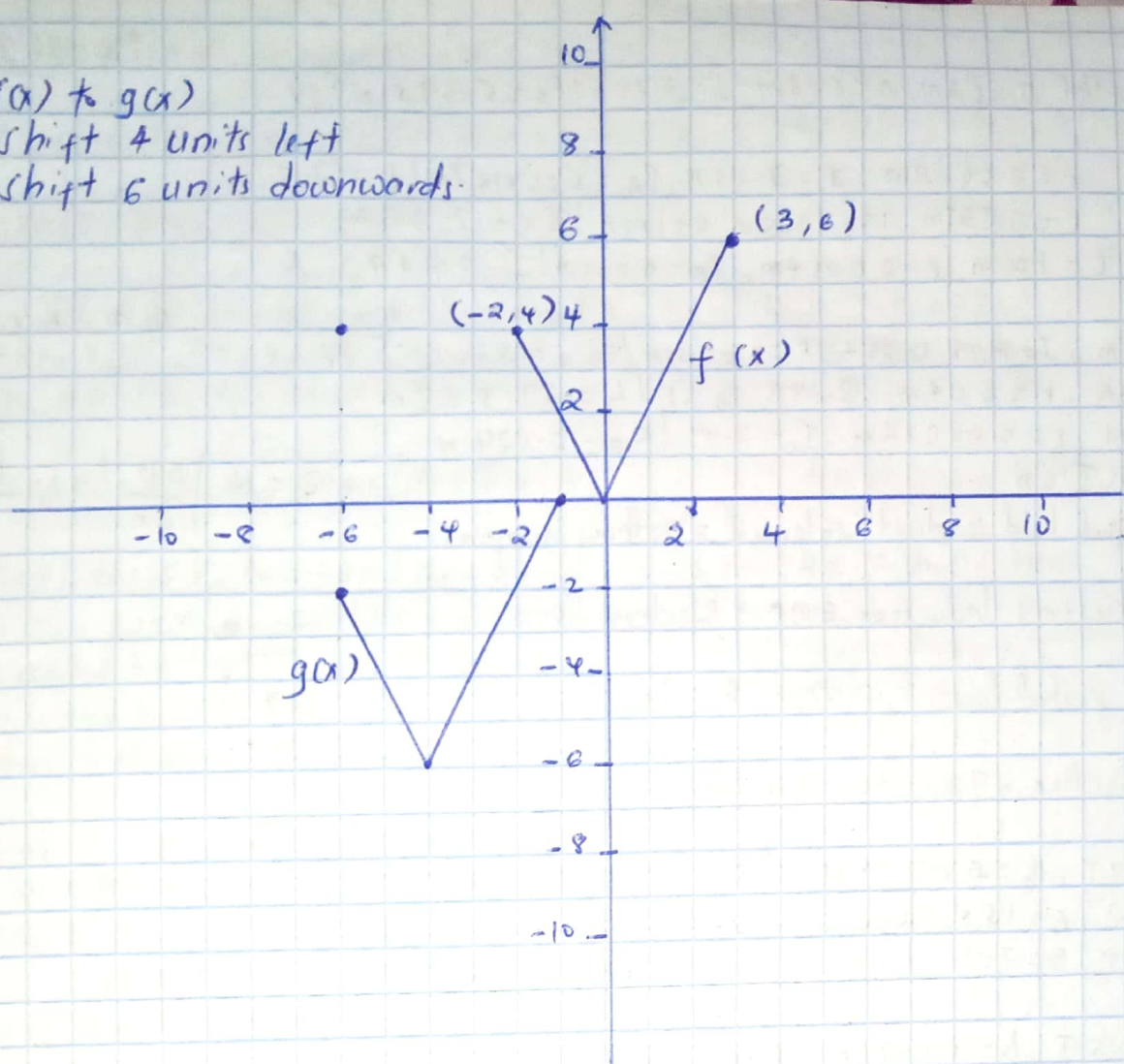
The graph is shifted 1 unit to the right, stretched vertically by 2215 units, then shifted upwards 62736 units

2. $R.O.C = m = \frac{0.512 - 0.581}{25 - 20} = -0.0138$

$$V(23) = 1 - 0.0138(23) \\ = 0.683$$

3 $f(x)$ & $g(x)$

- shift 4 units left
- shift 6 units downwards



4 $N(t) = -0.003084t^2 + 0.3512t + 0.04516$

(a) Vertex = (h, k)

$$h = \frac{-b}{2a} = \frac{-0.3512}{2(-0.003084)} = 56.939$$

$$k = N(h) = 0.003084(56.939)^2 + 0.3512(56.939) + 0.04516$$

$$k = 10.0437$$

$$\text{Vertex} = (56.939, 10.0437) \approx (57, 10.0437)$$

The consumption of nuclear power in the U.S. will be maximum in $1970 + 57 = 2027$ when it will be 10.0437 quadrillion BTUs.

(b) Horizontal intercept

Horizontal intercept occurs when $N(t) = 0$

$$-0.003084t^2 + 0.3512t + 0.04516 = 0$$

We will use the quadratic equation.

$$t_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-0.3512 \pm \sqrt{0.3512^2 - 4(-0.003084)(0.04516)}}{2(-0.003084)}$$

$$= \frac{-0.3512 \pm 0.35199}{-0.006168}$$

$$t_{1,2} = -0.1284, 114.007$$

Since we cannot have negative year, the horizontal intercept is $(114.007, 0)$

This means that after 114.007 years, the consumption of nuclear power in the U.S. will be 0.

(c)

