

At this point you can use the formula as it is or use log properties to simplify it.

As is:

$$t = 20 \quad (\text{year} = 2010)$$

$$y(20) = 100 e^{\frac{\ln(1.5)}{12}(20)} \quad (\text{in billions})$$

$$= \boxed{196.556 \text{ billion}} \quad \text{or}$$

$$= 196.556 \times 10^9$$

$$= 196,556 \times 10^6$$

$$= \boxed{196,556 \text{ million}}$$

$$= \underline{196,556,000,000}$$

Alternate - 1st use log properties to simplify formula (good log practice :))

$$y(t) = 100 e^{\ln(1.5) \cdot \left(\frac{t}{12}\right)}$$

$$= 100 e^{\ln(1.5)^{\frac{t}{12}}}$$

$$\boxed{y(t) = 100 \cdot 1.5^{\left(\frac{t}{12}\right)}}$$

this formula is easier to use!

$$\boxed{y(20) = 100 \cdot (1.5^{\frac{20}{12}}) \text{ billion}} \\ = \underline{196.556 \times 10^9} \quad \checkmark$$

(4.)