

- ❖ Show all work
- ❖ No notes, books, or calculators allowed.
- ❖ Write answers in lowest terms when possible

1. If y varies directly as x and $y = 9$ when $x = 6$, find y when $x = 10$.

$$\begin{aligned} y &= kx \\ 9 &= k \cdot 6 \\ \boxed{\frac{3}{2} = k} \end{aligned}$$
$$\begin{aligned} y &= \frac{3}{2} \cdot x \\ y &= \frac{3}{2} \cdot 10 \\ y &= 3 \cdot 5 \\ \boxed{y = 15} \end{aligned}$$

2. If y varies directly as x and $y = 2$ when $x = \frac{1}{2}$, find y when $x = 5$.

$$\begin{aligned} y &= kx \\ 2 &= k \cdot \frac{1}{2} \\ \boxed{4 = k} \end{aligned}$$
$$\begin{aligned} y &= 4x \\ y &= 4 \cdot 5 \\ \boxed{y = 20} \end{aligned}$$

3. If y varies inversely as x and $y = \frac{1}{2}$ when $x = 14$, find y when $x = \frac{1}{3}$.

$$\begin{aligned} y &= \frac{k}{x} \\ \frac{1}{2} &= \frac{k}{14} \\ \frac{14}{2} &= k \\ \boxed{7 = k} \end{aligned}$$
$$\begin{aligned} y &= \frac{7}{x} \\ y &= \frac{7}{\frac{1}{3}} \\ y &= 7 \cdot 3 \\ \boxed{y = 21} \end{aligned}$$