

Direct Variation: $y = k \cdot x$ or $y = \# \cdot x$
 (DV)
 If x is in numerator ex $y = 4x$ $y = \frac{1}{2}x = \frac{x}{2}$ $y = -3x$

Inverse Variation: $y = \frac{k}{x}$ or $y = \frac{\#}{x}$
 (IV)
 If x is in denominator ex $y = \frac{4}{x}$ $y = \frac{1}{2x}$ $y = \frac{-3}{x}$

Neither (N) ex $y = 2x + 3$ $y = \frac{4}{x-1}$
 If a + or - is in problem

Identify whether the equations are DV, IV, or N.

$\frac{4y}{4} = \frac{x}{4}$ $\frac{xy}{x} = \frac{-2}{x}$ $y \cdot x = \frac{10}{y}$ $y-1 = 2x$
 $y = \frac{x}{4}$ DV $y = \frac{-2}{x}$ IV $y = \frac{10}{x}$ IV $y = 2x+1$ N
 $y = 8x$ DV $y = x \cdot 2$ DV $y = \frac{10}{x}$ IV $y = \frac{3}{x}$ IV
 $y = 2x$ DV

* Must solve for y before making decision

ex ① **Direct Variation** $x=4$ when $y=-8$

$\hookrightarrow y = k \cdot x \rightarrow y = -2x$
 $\frac{-8}{4} = k \cdot \frac{4}{4}$
 $-2 = k$

② Use this equation to calculate y when $x=5$.

$y = -2x$
 $y = -2 \cdot 5$
 $y = -10$

① **Inverse Variation** $x=6$ when $y=-18$

$\hookrightarrow y = \frac{k}{x}$ $y = \frac{-108}{x}$
 $6 \cdot -18 = \frac{k}{6}$
 $-108 = k$

~~$k = 108$~~ ~~$-18 = \frac{k}{6}$~~ ~~$-18 = \frac{-108}{6}$~~ ~~$y = \frac{k}{x}$~~

② Use this equation to calculate y when $x=36$.

$y = \frac{-108}{x} \leftarrow 36$ $y = \frac{-108}{36} = \frac{-54}{18} = \frac{-6}{2} = -3$
 $y = -3$