Direct Variation from an Equation   Solve for $y = Kx + 0$

1. $y + 1 = 2x$
   $\quad -1 \qquad -1$
   $y = 2x - 1$ (NO)

2. $\frac{1}{2}y = x$ (2)
   $y = 2x$ (Yes)

Tell whether x and y show direct variation.

1. $y - x = 4$
   $\quad +x \qquad +x$
   $y = x + 4$ (NO)

2. $\frac{5}{2}x = \frac{2}{5}y$ $\left(\frac{5}{2}\right)$
   $\frac{5}{2}x = y$
   $y = \frac{5}{2}x$ (yes)

3. $8 = xy$
   $\frac{8}{x} = \frac{xy}{x}$
   $\frac{8}{x} = y$
   $y = \frac{8}{x}$ (NO)

4. $\frac{x}{y} = 2$ (y)
   $\frac{x}{2} = \frac{2y}{2}$
   $\frac{1}{2}x = y$ (yes)

5. $y - 5 = 2x$
   $\quad +5 \qquad +5$
   $y = 2x + 5$ (yes)

Solving and Writing Direct Variation Equations

output $\quad$ $y = kx$ $\quad$ input

1. Constant of Proportionality: $\frac{1}{2}$
   $x = -6, y = ?$

   $y = Kx$
   $y = \frac{1}{2}(-6)$
   $\boxed{y = -3}$

2. Constant of Proportionality: 4
   $x = ?, y = 6$

   $y = Kx$
   $6 = 4x$
   $\boxed{1.5 = x}$

3. Suppose y varies directly with x. If y = 3 and x = 15, then find x when y = 5.
   $y = Kx$
   $3 = K(15)$
   $\frac{1}{5} = K$ $\quad \dashrightarrow$ $5 = \frac{1}{5}x$ $\Rightarrow$ $\boxed{25 = x}$

4. Suppose x and y are directly proportional. If x = 15 and y = 12, find x when y = 21.
   $y = Kx$
   $12 = K(15)$
   $\frac{4}{5} = K$ $\quad \dashrightarrow$ $21 = \frac{4}{5}x$ $\Rightarrow$ $\boxed{26\frac{1}{4} = x}$
   $\frac{105}{4} = x$

5. Suppose y varies directly with x. Find x when y = 10, when y = -7 when x = -14.
   $y = Kx$
   $-7 = K(-14)$
   $\frac{1}{2} = K$ $\quad \dashrightarrow$ $10 = \frac{1}{2}x$ $\Rightarrow$ $\boxed{20 = x}$

1) Solve for x
2) Solve for ?