

9.4 Direct, Joint, Inverse Variation

- k is the constant (number)

▪ Direct $y = kx$ or $\frac{y}{x} = k$

▪ Joint $y = kxz$ or $\frac{y}{xz} = k$

▪ Inverse $y = \frac{k}{x}$ or $xy = k$

- Know word problems dealing with each of these variations.

Example

If y varies inversely as x and $y = 9$ when $x = 2.5$, find y when $x = -6$

$$\frac{y_1}{y_2} = \frac{x_2}{x_1}$$

$$\frac{9}{y_2} = \frac{-6}{2.5}$$

$$y_2 = -37.5$$

9.5 Classes of Functions

- Know each **function** by its **equation and graph**.

9.6 Solving Equations & Solving Inequalities

- Wipe out fractions by multiplying through
- Know word problems from this section - I've given you enough examples.

Equation Example

$$\left[\frac{r}{1} + \frac{r^2 - 5}{r^2 - 1} = \frac{r^2 + r + 2}{r + 1} \right] \cdot \frac{(r+1)(r-1)}{1}$$

$$r(r^2 - 1) + r^2 - 5 = (r^2 + r + 2)(r - 1)$$

$$r^3 - r + r^2 - 5 = r^3 + r^2 + 2r - r^2 - r - 2$$

$$r^3 + r^2 - r - 5 = r^3 + r^2 - r - 2$$

$$r^2 - 2r - 3 = 0 \rightarrow (r-3)(r+1) = 0$$

Inequality Example

1. Find out what value x cannot have.
2. Solve the related equation.
3. Test each region to see where solution set is.

$$\frac{1}{2p} + \frac{3}{4p} < \frac{1}{2}$$

$$\textcircled{1} p \neq 0$$

$$\textcircled{2} \left[\frac{1}{2p} + \frac{3}{4p} = \frac{1}{2} \right] \cdot 4p$$

$$2 + 3 = 2p$$

$$5 = 2p$$

$$2.5 = p$$

or $p < 0$ or $p > 2.5$

