

Inequalities Worksheet

Solve the following inequalities:

1. Linear

(a) $4x + 5 > x - 2$.

$$x > -\frac{7}{3}$$

(b) $3(x + 1) \leq 2x - 7$.

$$x \leq -10$$

(c) $\frac{4-x}{3} > 7x + 1$.

$$x < \frac{1}{22}$$

(d) $\frac{x}{3} - \frac{2x+1}{4} \leq x$.

$$x \geq -\frac{3}{14}$$

2. Quadratic

(a) $(x - 3)(x + 4) > 0$.

$$x > 3 \text{ or } x < -4$$

(b) $(2x + 1)(x - 5) < 0$.

$$-\frac{1}{2} < x < 5$$

(c) $(3 - x)(x + 4) \geq 0$.

$$-4 \leq x \leq 3$$

(d) $(4 - 3x)(1 - 2x) < 0$.

$$\frac{1}{2} < x < \frac{4}{3}$$

(e) $x^2 < 100$.

$$-10 < x < 10$$

(f) $x^2 - 11x + 24 \leq 0$.

$$3 \leq x \leq 8$$

(g) $2x^2 + x - 15 > 0$.

$$x < -3 \text{ or } x > \frac{5}{2}$$

(h) $6x^2 + 11x + 3 < 0$.

$$-\frac{3}{2} < x < -\frac{1}{3}$$

(i) $2x^2 \geq 3 - 5x$.

$$x \leq -3 \text{ or } x \geq \frac{1}{2}$$

(j) $(x + 7)(x + 1) < 14 + 2x$.

$$-7 < x < 1$$

(k) $x^2 \leq \frac{4-11x}{3}$.

$$-4 \leq x \leq \frac{1}{3}$$

(l) $(x + 1)^2 \geq 0$. [Think!]

$$\text{All } x$$

3. Other

(a) $(x - 1)(x - 2)(x - 3) > 0$.

(b) $(2x - 1)(x + 3)(3x + 1) \leq 0$.

(c) $(3 - x)(2 - x)(1 - x) < 0$.

(d) $(x - 1)(x - 2)(x - 3)(x - 4)(x - 5) \geq 0$.

(e) Using your calculator investigate the inequalities $\sin x > 0$ and $\cos x > 0$.