

3) $13 - 4i$

30) 61

$a + bi$

6) $\sqrt{5} - 2$

33) $\frac{2}{5} - \frac{1}{5}i$

$i = \sqrt{-1}$

9) $7 + 4i$

36) $\frac{1}{3} - \frac{2}{3}i$

$i^2 = -1$

12) $-13 - i$

39) $\frac{7}{5} - \frac{1}{5}i$

15) $5 - 10i$

41) $-1 \pm 2i$

18) $5i$

42) $-\frac{1}{6} \pm \frac{\sqrt{23}}{6}i$

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9) $(2 + 3i)(2 - i)$

$(2)(2) + (-2i) + 6i - 3i^2$

$4 + -2i + 6i - 3(-1)$

$4 + 4i + 3$

$7 + 4i$

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$$33) \frac{1}{2+i} \frac{(2-i)}{(2-i)}$$

$$\frac{2-i}{2^2 - \underbrace{(i^2)}} = \frac{2-i}{4 - -1}$$

$$1^{\text{st}} \text{ term}^2 - \text{last term}^2$$

$$= \frac{2-i}{5}$$

$$= \frac{2}{5} - \frac{1}{5}i$$

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$$39) \frac{(1-i)(2-i)}{1-2i} = \frac{2-i-2i+\underbrace{i^2}^{-1}}{1-2i}$$

$$\frac{2-3i-1}{1-2i}$$

$$\frac{1-3i}{1-2i} \frac{(1+2i)}{(1+2i)}$$

$$\frac{1+2i-3i-\underbrace{(i^2)}^{+1}}{1-(2i)^2} \quad \begin{array}{r} -6(-1) \\ --6 \\ +6 \end{array}$$

$$\frac{1-i+6}{1-4i^2}$$

$$\frac{7-i}{1-4(-1)} = \frac{7-i}{5}$$

$$a+bi$$

$$\frac{7}{5} - \frac{1}{5}i$$

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$$30 \quad (5-6i)(5+6i)$$

$$5^2 - (6i)^2$$

$$25 - 36i^2$$

$$25 - -36$$

$$25 + 36$$

$$61$$

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Solving Inequalities Algebraically and Graphically

- Solving Absolute Value Inequalities
- Solving Quadratic Inequalities

~These techniques are involved in using a graphing utility to solve inequalities in this textbook

Sections P7:

HW: Pg 58. #'s 3-24 by 3's, 34

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Solving an Absolute Value Equation

Solve

$$-7 < |2x + 3| < 7$$

less than "AND" $_ < x < _$ (,)

$$\begin{array}{r} -7 < 2x + 3 < 7 \\ -3 \quad -3 \quad -3 \\ \hline \end{array}$$

$$-10 < 2x < 4$$

$$-5 < x < 2$$

$$(-5, 2)$$

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Solving an Absolute Value Inequality

Solve

$$|x - 4| < 8$$

$$-8 < x - 4 < 8$$

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Solving an Absolute Value Inequality

Solve

$$|3x - 2| \geq 5$$

GREATER THAN "OR"

$$x \leq \text{---} \quad \text{OR} \quad x \geq \text{---}$$

$$(-\infty,] \quad \cup \quad [, \infty)$$

$$3x - 2 \leq -5$$

$$3x \leq -3$$

$$x \leq -1$$

$$3x - 2 \geq 5$$

$$3x \geq 7$$

$$x \geq \frac{7}{3}$$

$$x \leq -1 \text{ or } x \geq \frac{7}{3}$$

$$(-\infty, -1] \cup [\frac{7}{3}, \infty)$$

Aug 20-8:43 AM

Solving a Quadratic Inequality

Solve

$$x^2 - x - 12 > 0$$

$$(x - 4)(x + 3)$$

$$\begin{array}{r} 12 \\ / \quad \backslash \\ 3 \quad 4 \end{array}$$

$$x - 4 = 0$$

$$x = 4$$

$$x + 3 = 0$$

$$x = -3$$

$$(-\infty, -3) \cup (4, \infty)$$

Aug 20-8:43 AM

Solving a Quadratic Inequality

Solve

$$2x^2 + 3x \leq 20$$

[,]

$$2x^2 + 3x - 20 \leq 0$$

_ $\leq x \leq$ _

$2x^2$	$8x$
$-5x$	-20

$$(2)(-20) = -40$$

$$\begin{array}{cc} 4 & 10 \\ \hline 5 & 8 \end{array}$$

[-4, $\frac{5}{2}$]

$$(x+4)(2x-5)$$

$$x = -4 \quad x = \frac{5}{2}$$

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Solving a Quadratic Inequality Graphically

Solve

$$x^2 - 4x \geq -1$$

$$x^2 - 4x + 1 \geq 0$$

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Projectile Motion

Suppose an object is launched vertically from a point s_0 feet above the ground with an initial velocity of v_0 feet per second. The vertical position s (in feet) of the object t seconds after it is launched is

$$s = -16t^2 + v_0t + \underline{s_0}$$

$$S = -16t^2 + \overbrace{v_0}^{\text{initial velocity}} t + \overbrace{s_0}^{\text{initial height}}$$

↑ vertical position

$$h = -16t^2 + v_0t + h_0$$

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Finding the Height of a Projectile

A projectile is launched straight up from ground level with an initial velocity of 288 ft/sec.

v_0

$$s_0 = 0$$

When will the projectile's height reach 1152 ft above the ground?

$$S = -16t^2 + v_0t + s_0$$

$$1152 = -16t^2 + 288t + 0$$

$$0 = -16t^2 + 288t - 1152 \quad \text{mult by } -1$$

$$0 = 16t^2 - 288t + 1152$$

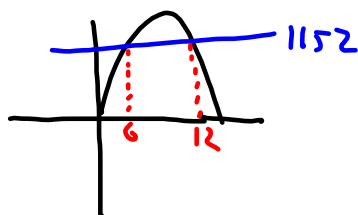
$$0 = t^2 - 18t + 72$$

$$(t-6)(t-12)$$

When will the projectile's height be at least 1152 ft above the ground?

$$t = 6s$$

$$t = 12s$$



$$[6, 12]$$

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$$6) \quad |3-2x| + 2 > 5$$

$$\quad \quad \quad -2 \quad -2$$

$$|3-2x| > 3$$

$$-3 < 3-2x$$

$$3-2x > 3$$

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$$3) (1, 5)$$

$$6) (-\infty, 0) \cup (3, \infty)$$

$$9) [-7, -\frac{3}{2}]$$

< AND

$$12) (\frac{1}{4}, 2)$$

$$15) [-1, 0] \cup [1, \infty)$$

$$18) (-\infty, \frac{3}{4}] \cup [\frac{4}{3}, \infty)$$

$$21) (-\infty, -1.41] \cup [.08, \infty)$$

$$24) x = 3$$

$$34a) t = 12 \text{ or } t = 5$$

$$b) 9 \text{ of } t \quad (5, 12)$$

$$c) (0, 5] \text{ or } [12, 17)$$

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$$34) S = -16t^2 + v_0 t + s_0$$

$$960 = -16t^2 + 272t + 0$$

$$\begin{array}{r} -960 \qquad \qquad \qquad -960 \\ \hline \end{array}$$

$$0 = -16t^2 + 272t - 960$$

$$0 = t^2 - 17t + 60$$

$$= (t - 5)(t - 12)$$

$$b) (5, 12) \quad t = 5s \quad t = 12s$$

$$c) (0, 5] \cup [12, 17)$$

$$0 = -16t^2 + 272t$$

$$16t^2 = 272t$$

$$t^2 = 17t$$

$$\div \text{by } -16$$

$$\begin{array}{r} 60 \\ 3 \quad 20 \\ 4 \quad 15 \\ -5 \quad -12 \end{array}$$

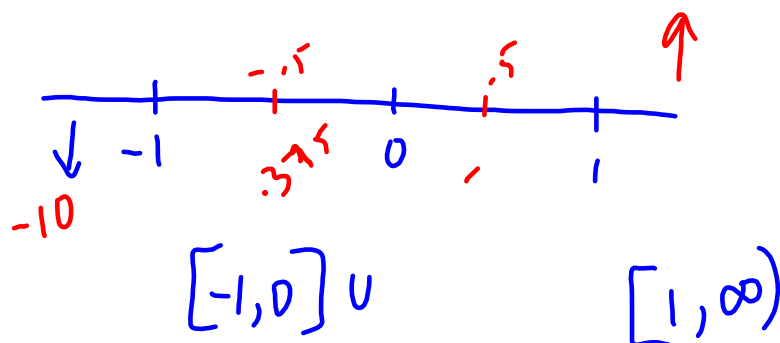
Sep 1-11:25 AM

$$15) x^3 - x \geq 0$$

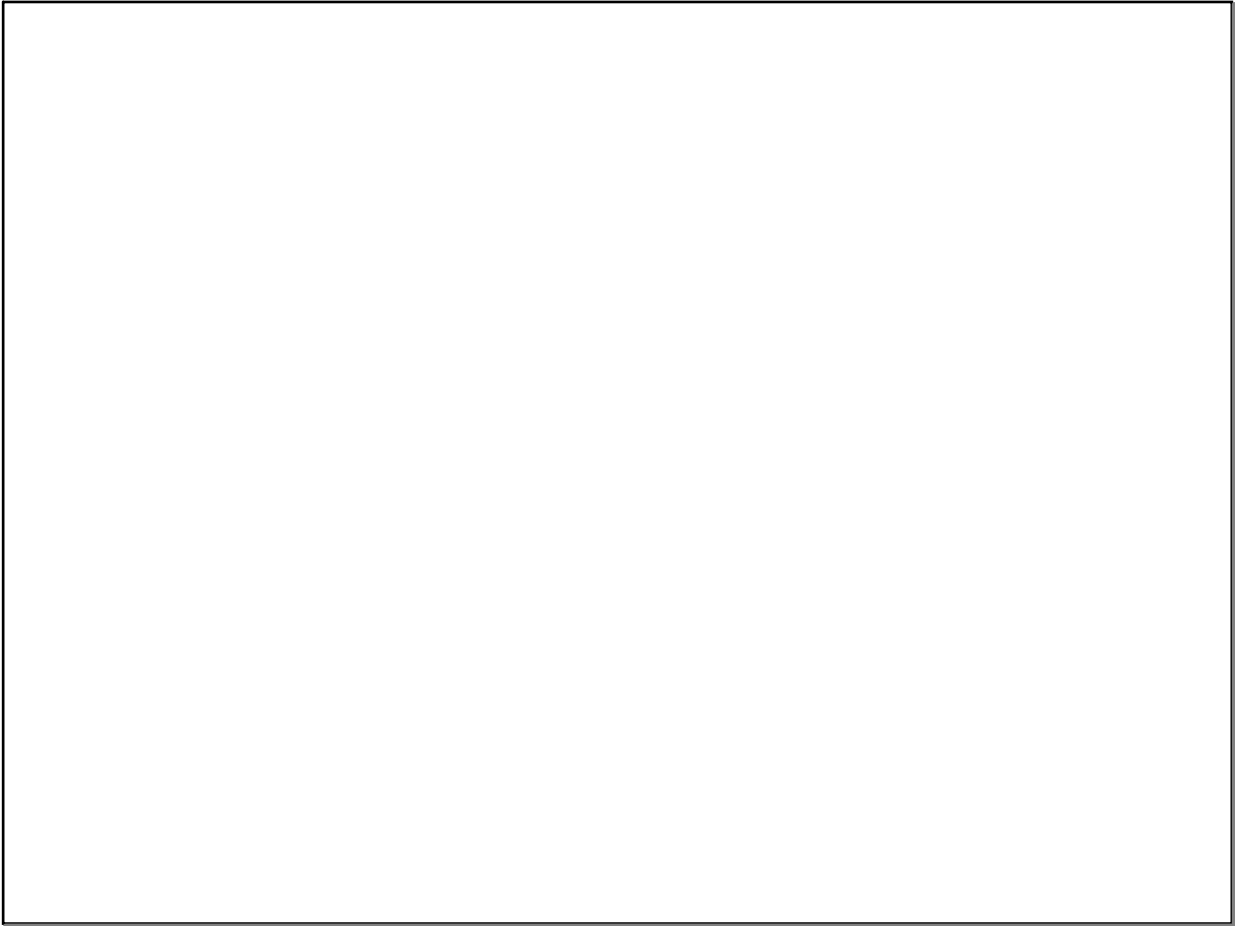
$$x(x^2 - 1) \geq 0$$

$$x(x+1)(x-1) \geq 0$$

$$x = 0 \quad x = -1 \quad x = 1$$



Sep 1-11:35 AM



Sep 1-12:44 PM