

Classwork/ Homework

Pg. 548-550 #28-92 even

$$28) \frac{4}{x^2 + 1} = \frac{1}{1}$$

$$\begin{array}{r} x^2 + 1 = 4 \\ -1 \quad -1 \\ \hline \sqrt{x^2} = \sqrt{3} \end{array}$$

$$\boxed{x = \pm \sqrt{3}}$$

$$30) \frac{2}{1-x^2} = \frac{x^2}{x^2+1}$$

$$\frac{\begin{matrix} x^2 - x^4 \\ -x^2 + x^4 \end{matrix}}{\begin{matrix} +x^4 \\ -x^2 \end{matrix}} = \frac{2x^2 + 2}{+x^4 - x^2}$$

$$x^4 + x^2 + 2 = 0$$

$$u = x^2$$

$$u^2 + u + 2 = 0$$

$$a = 1$$

$$b = 1$$

$$c = 2$$

$$u = \frac{-1 \pm \sqrt{1^2 - 4(1)(2)}}{2(1)}$$

$$= \frac{-1 \pm \sqrt{-7}}{2}$$

No Solution

$$32) \frac{1}{x} = \frac{x+2}{x+1}$$

$$x^2 + 2x = x + 1$$

$$\underline{-x-1 \quad -x-1}$$

$$x^2 + x - 1 = 0$$

$$a = 1$$

$$b = 1$$

$$c = -1$$

$$x = \frac{-1 \pm \sqrt{1^2 - 4(1)(-1)}}{2(1)}$$

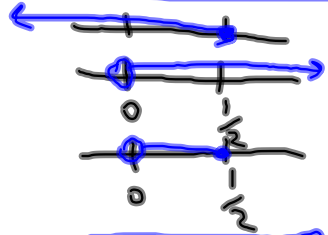
$$x = \frac{-1 \pm \sqrt{5}}{2}$$

$$34) \frac{1}{x} \geq \frac{2}{1}$$

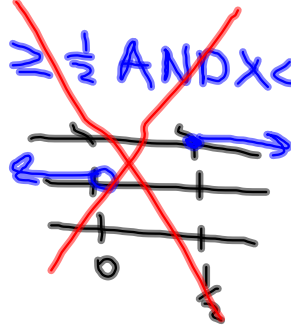
$$1 \geq 2x \text{ AND } x > 0 \text{ OR } 1 \leq 2x \text{ AND } x < 0$$

$$\frac{2x}{2} \leq \frac{1}{2} \text{ AND } x > 0 \text{ OR } \frac{2x}{2} \geq \frac{1}{2} \text{ AND } x < 0$$

$$\underline{x \leq \frac{1}{2} \text{ AND } x > 0 \text{ OR } x \geq \frac{1}{2} \text{ AND } x < 0}$$



$$0 < x \leq \frac{1}{2}$$



$$36) \frac{1}{x^2+1} \geq \frac{1}{3}$$

$$3 \geq x^2+1 \text{ AND } x^2+1 > 0 \text{ OR } \cancel{3 \leq x^2+1 \text{ AND } x^2+1 < 0}$$

$$x^2+1 \leq 3$$

$$\begin{array}{r} x^2+1 \leq 3 \\ \underline{-1 \quad -1} \\ \sqrt{x^2} \leq \sqrt{2} \end{array}$$

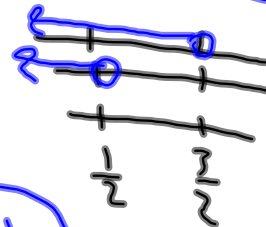
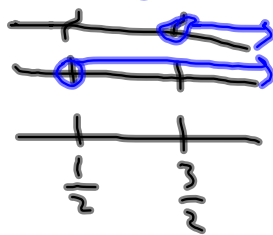
$$\boxed{-\sqrt{2} \leq x \leq \sqrt{2}}$$

$$38) \frac{1+2x}{2x-1} < \frac{2}{1}$$

$$1+2x < 4x-2 \text{ AND } 2x-1 > 0 \text{ OR } 1+2x > 4x-2 \text{ AND } 2x-1 < 0$$

$$\begin{array}{r} -1 \quad -4x \quad -4x \quad -1 \\ \hline -2x < -3 \\ \hline -2 \quad -2 \end{array} \qquad \begin{array}{r} +1 \quad +1 \\ \hline 2x > 1 \\ \hline 2 \quad 2 \end{array}$$

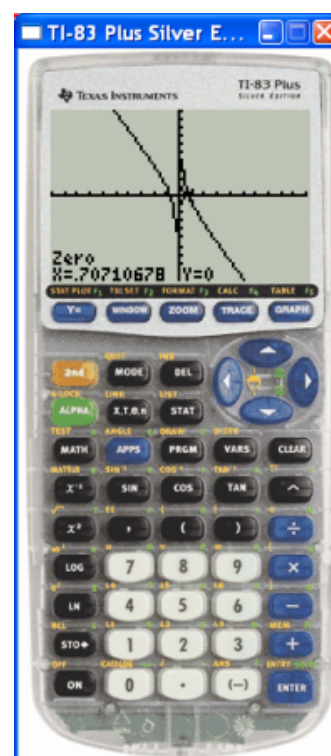
$$\boxed{x > \frac{3}{2}} \text{ AND } x > \frac{1}{2} \text{ OR } x < \frac{3}{2} \text{ AND } \boxed{x < \frac{1}{2}}$$



$$\boxed{x > \frac{3}{2} \text{ OR } x < \frac{1}{2}}$$

$$40) \frac{1}{x} < 2x$$
$$\frac{-2x \quad -2x}{x} < 0$$

$$-0.7 < x < 0 \text{ OR } 0.7 < x < \infty$$

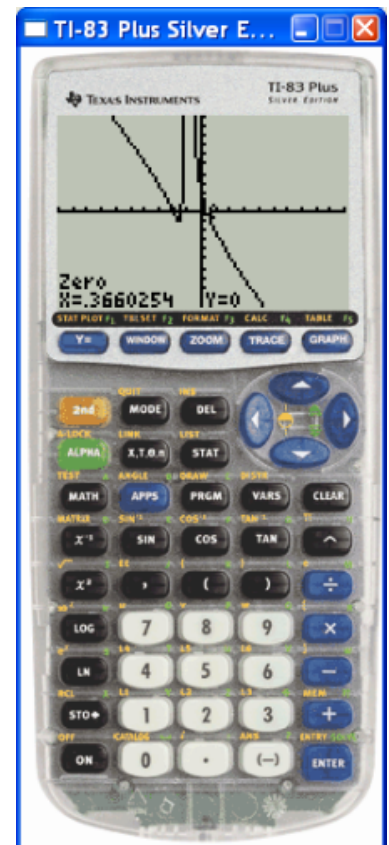


$$42) \frac{x^3 + 2}{x^2 + 2x + 1} \leq 3x$$

-3x -3x

$$\frac{x^3 + 2}{x^2 + 2x + 1} - 3x \leq 0$$

$$-2 \leq x \leq -1.4 \text{ OR } .4 \leq x < \infty$$

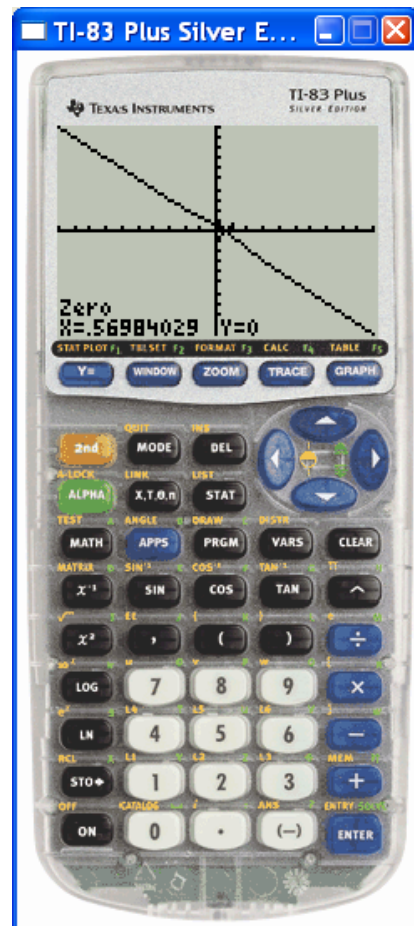


$$44) \frac{1}{x^2 - x + 2} < x$$

-x -x

$$\frac{1}{x^2 - x + 2} - x < 0$$

$$.6 < x < \infty$$



$$46) y = 8x + 12 + x^2$$

$$x = 8y + 12 + y^2$$

$$x = y^2 + 8y + 12$$

$$\underline{-x} \qquad \qquad \qquad \underline{-x}$$

$$y^2 + 8y + 12 - x = 0$$

$$a = 1$$

$$b = 8$$

$$c = 12 - x$$

$$y = \frac{-8 \pm \sqrt{8^2 - 4(1)(12-x)}}{2(1)}$$

$$= \frac{-8 \pm \sqrt{64 - 48 + 4x}}{2}$$

$$y = \frac{-8 \pm \sqrt{16 + 4x}}{2} = \frac{-8 \pm 2\sqrt{4+x}}{2} = \frac{-4 \pm \sqrt{4+x}}{1}$$

$$48) y = 2x^2 + 7x + 6$$

$$\underline{x = 2y^2 + 7y + 6 - x}$$

$$2y^2 + 7y + 6 - x = 0$$

$$a = 2$$

$$b = 7$$

$$c = 6 - x$$

$$y = \frac{-7 \pm \sqrt{7^2 - 4(2)(6-x)}}{2(2)}$$

$$= \frac{-7 \pm \sqrt{49 - 48 + 8x}}{4}$$

$$y = \frac{-7 \pm \sqrt{1 + 8x}}{4}$$

$$50) h(x) = 3\sqrt{x} - 5$$

Vertical stretch by 3

Vertical Trans. 5 units down

$$52) g(x) = 4\sqrt{2x+1} + 2$$

$$g(x) = 4\sqrt{2(x+\frac{1}{2})} + 2$$

vertical stretch by 4

horiz. comp. by $\frac{1}{2}$

horiz. ^{Trans} $\frac{1}{2}$ left

Vertical Trans 2 up

$$54) f(x) = 5\sqrt{3(x-1)} + 1$$

Vertical stretch by 5
horiz. comp. by $\frac{1}{3}$
horiz. Trans. 1 right
Vertical Trans 1 up.

$$56) \frac{1}{2} \sqrt[3]{8} + 1$$

$$\frac{1}{2} (2) + 1$$

$$1 + 1$$

$$\boxed{2}$$

$$58) (5a^3b^5)^{\frac{1}{3}} \sqrt[3]{4a^4b}$$

$$\sqrt[3]{5a^3b^5} \cdot \sqrt[3]{4a^4b}$$

$$\sqrt[3]{20a^7b^6}$$

$$\sqrt[3]{20a^3a^3a b^3b^3}$$

$$\boxed{a^2 b^2 \sqrt[3]{20a}}$$

$$\begin{aligned}
 60) \quad \frac{(45 s^3 T^6)^{\frac{1}{2}}}{\sqrt{3 T^2}} &= \frac{\sqrt{45 s^3 T^6}}{\sqrt{3 T^2}} \\
 &= \sqrt{\frac{\cancel{45} s^3 T^{\cancel{6}^4}}{\cancel{3} T^{\cancel{2}}}} = \sqrt{15 s^3 T^4} \\
 &= \sqrt{15 s^2 s T^2 T^2} \\
 &= s T^2 \sqrt{15 s}
 \end{aligned}$$

$$62) \frac{(24m^9n)^{1/3} \sqrt[3]{9m^3n^7}}{\sqrt[3]{3mn^2}}$$

$$\frac{\sqrt[3]{24m^9n} \sqrt[3]{9m^3n^7}}{\sqrt[3]{3mn^2}} = \sqrt[3]{\frac{216m^{12}n^8}{3mn^2}}$$

$$\sqrt[3]{2^3 \cdot 9m^3 m^3 m^3 n^2 n^3 n^3}$$

$2m^3 n^2 \sqrt[3]{9m^2}$

$$64) \frac{1}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$$
$$\boxed{\frac{\sqrt{7}}{7}}$$

$$66) \frac{4}{-2+\sqrt{5}} \cdot \frac{-2-\sqrt{5}}{-2-\sqrt{5}}$$

$$\frac{-8-4\sqrt{5}}{4-5} = \frac{-8-4\sqrt{5}}{-1}$$

$$\boxed{8+4\sqrt{5}}$$

$$68) \frac{2-\sqrt{3}}{3+\sqrt{2}} \cdot \frac{3-\sqrt{2}}{3-\sqrt{2}}$$

$$\frac{6-2\sqrt{2}-3\sqrt{3}+\sqrt{6}}{9-2}$$

$$\# \frac{6-2\sqrt{2}-3\sqrt{3}+\sqrt{6}}{7}$$

$$70) \quad \underbrace{3\sqrt{x+7} + 8 = 6}_{-8 \quad -8}$$

$$\underbrace{\frac{3\sqrt{x+7}}{3} = \frac{-2}{3}}$$

$$\sqrt{x+7} = -\frac{2}{3}$$

No Solution

$$72) \quad 3 \sqrt[3]{x+7} + 8 = 6$$

$$\underline{3 \sqrt[3]{x+7} = \frac{-2}{3}}$$

$$\left(\sqrt[3]{x+7}\right)^3 = \left(-\frac{2}{3}\right)^3$$

$$x+7 = -\frac{8}{27} - \frac{189}{27}$$

$$\boxed{x = -\frac{197}{27}}$$

$$74) (\sqrt{x+2})^2 = 3^2$$

$$\begin{array}{r} x+2=9 \\ -2 \quad -2 \\ \hline \end{array}$$

$$\boxed{x=7}$$

$$76) \sqrt{2x+1} = \sqrt{4x-4}$$

$$2x+1 = 4x-4$$
$$\frac{-2x+4}{-2x+4} \quad \frac{-2x+4}{-2x+4}$$

$$\frac{5}{2} = \frac{2x}{2}$$

$$x = \frac{5}{2}$$

$$78) (\sqrt[5]{2x})^5 = (\sqrt[5]{x+3})^5$$

$$\begin{array}{r} 2x = x + 3 \\ -x \quad -x \\ \hline \boxed{x = 3} \end{array}$$

$$80) \sqrt{3x} - 1 = \sqrt{x+2} + 1$$

$$(\sqrt{3x} - \sqrt{x+2})^2 = 1^2$$

$$(\sqrt{3x} - \sqrt{x+2})(\sqrt{3x} - \sqrt{x+2}) = 1$$

$$3x - \sqrt{3x^2+6x} - \sqrt{3x^2+6x} + x+2 = 1$$

$$4x - 2\sqrt{3x^2+6x} + 2 = 1$$

$$-2\sqrt{3x^2+6x} = -4x - 1$$

$$\sqrt{3x^2+6x} = \frac{2x}{1} + \frac{1}{2} = \sqrt{3x^2+6x} = \left(\frac{4x+1}{2}\right)^2$$

$$3x^2 + 6x = (4x+1)(4x+1)$$

$$4 \left[3x^2 + 6x = \frac{16x^2 + 8x + 1}{4} \right]$$

$$12x^2 + 24x = 16x^2 + 8x + 1$$

$$-12x^2 - 24x - 12x^2 - 24x$$

$$4x^2 - 16x + 1 = 0$$

$$a=4$$

$$x = \frac{16 \pm \sqrt{(-16)^2 - 4(4)(1)}}{2(4)}$$

$$b=-16$$

$$c=1$$

$$x = \frac{16 \pm \sqrt{240}}{8}$$

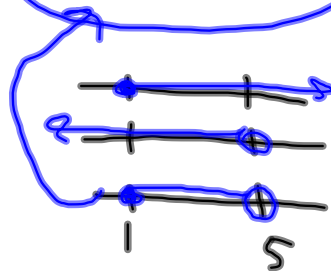
$$82) (\sqrt{x-1})^2 < 2^2$$

$$x-1 \geq 0 \text{ AND } x-1 < 4$$

+1 +1 +1 +1

$$x \geq 1 \text{ AND } x < 5$$

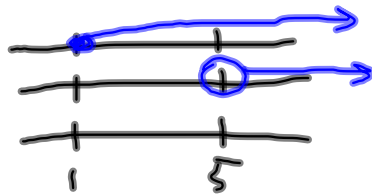
$$(1 \leq x < 5)$$



$$84) (\sqrt{x-1})^2 > 2^2$$

$$\begin{array}{c} x-1 \geq 0 \quad \text{AND} \quad x-1 > 4 \\ +1 \quad +1 \qquad \qquad \qquad +1 \quad +1 \end{array}$$

$$x \geq 1 \quad \text{AND} \quad \boxed{x > 5}$$



$$\boxed{x > 5}$$

$$86) (\sqrt{x-1})^3 < 1^3$$

$$\begin{array}{r} x-1 < 1 \\ +1 \quad +1 \\ \hline \end{array}$$

$$\boxed{x < 2}$$

$$88) \frac{-2\sqrt{x-2}}{-2} < \frac{-1}{-2}$$
$$(\sqrt{x-2})^2 > \left(\frac{1}{2}\right)^2$$

$$\frac{x-2}{+2} \geq \frac{0}{+2} \text{ AND } \frac{x-2}{+2} > \frac{1}{4} + \frac{8}{4}$$

$$x \geq 2 \text{ AND } x > \frac{9}{4}$$

$$x > \frac{9}{4}$$

$$90) \frac{4\sqrt{5x-1}}{4} < \frac{0}{4}$$

$$\sqrt{5x-1} < 0$$

No Solution

$$92) \sqrt{2x+1} \geq 2$$

-2 -2

$$\sqrt{2x+1} - 2 \geq 0$$

$$15.5 \leq x < \infty$$

