$$[x-(3-\sqrt{5})][x-(3+\sqrt{5})]$$

$$= x^2 - x(3+\sqrt{5}) - (3-\sqrt{5})x + (3-\sqrt{5})(3+\sqrt{5})$$

$$= x^2 - 3x - \sqrt{5}x - 3x + \sqrt{5}x + 9 - 5$$

$$= x^2 - 6x + 4$$

$$(x-(4+i))(x-(4-i))$$

$$6x^3 + 25x^2 - 24x + 5 = 0$$

2 or 0 pos. zeros

$$f(-x) = -6x^3 + 25x^2 + 24x + 5$$

1 negative zero.

$$\frac{p}{q} = \pm 1, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{1}{6}, \pm 5, \pm \frac{5}{2}, \pm \frac{5}{3}, \pm \frac{5}{6}$$

-1 Nope

$$\begin{array}{r|rrrr} -5 & 6 & 25 & -24 & 5 \\ & & -30 & 25 & -5 \\ \hline & 6 & -5 & 1 & \end{array}$$

$x = -5$

$(x+5)(6x^2 - 5x + 1)$

$a = 6, b = -5, c = 1$

$(-5)^2 - 4(6)(1)$

$= 25 - 24 = 1$

It factors over the rationals. b/c 1 is a perfect.

Factoring it, as we know before MAT 121.

$(2x-1)(3x-1)$

FTA says EVERY polynomial factors over the complex #s.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{5 \pm \sqrt{1}}{2(6)} = \frac{5 \pm 1}{12} \to \frac{1}{2}, \frac{1}{3}$$

$$\boxed{x = -5, \frac{1}{2}, \frac{1}{3}}$$

$$f(x) = 6(x+5)(x-\tfrac{1}{2})(x-\tfrac{1}{3})$$

$$\left(\sqrt{x-1}\right)^2 = (x-7)^2$$

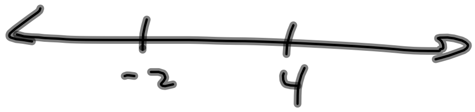
$$x-1 = x^2 - 14x + 49$$
$$-x+1 = \quad -x + 1$$
$$0 = x^2 - 15x + 50 = 0$$
$$(x-5)(x-10) = 0$$
$$x \in \{5, 10\}$$

Extraneous

$$\sqrt{5-1} = \sqrt{4} = 2 \stackrel{?}{=} 5-7$$
$$2 = -2$$
Nope

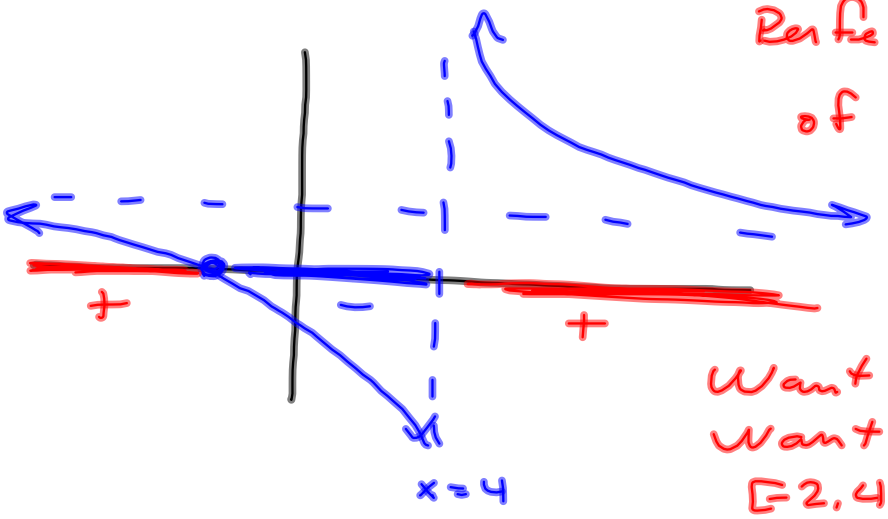
$$\sqrt{10-1} = 3 = 10-7 \checkmark$$

$\frac{x-4}{x+2} \le 0 \qquad x \ne -2$



H.A. $y = 1$

Perfect graph of $\frac{x+2}{x-4}$



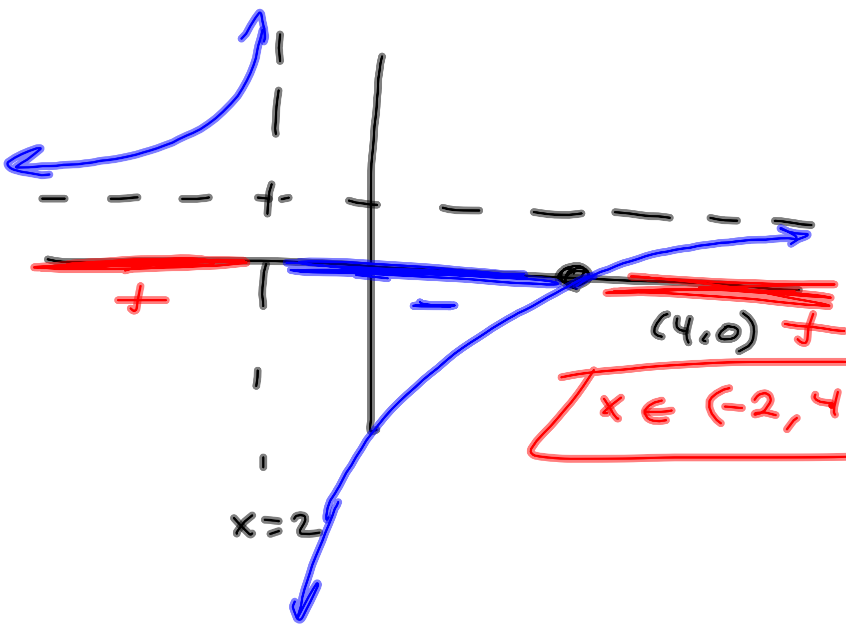
Want ≤ 0

want −

$[-2, 4)$

Perfect solution for $\frac{x+2}{x-4} \le 0$

The ACTUAL Quiz question $\frac{x-4}{x+2}$ looks like:



$\boxed{x \in (-2, 4]}$ for ≤ 0 question

Chapter 3 practice Test

Tuesday B4 Thanksgiving.

Chapter 4 Test (Practice)

Next week

§8.2 #s 6, 8, 18*, 20, 22, 26, 29, 32, 38

* Expand $(i-2)(i-3)$ & apply

$\sum_{i=1}^{n} 1 = n$ $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$

$\sum_{i=1}^{n} 7 = 7\sum_{i=1}^{n} 1$ $\sum_{i=1}^{n} 13i = 13\sum_{i=1}^{n} i$

$13\cdot1 + 13\cdot2 + 13\cdot3 + \cdots + 13\cdot n$

$= 13[1+2+3+\cdots+n]$

$= 13\sum i$

$\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$

$$\boxed{\begin{gathered}1^2+2^2+3^2+\cdots+n^2 \\ \neq (1+2+3+\cdots+n)^2\end{gathered}} \rightarrow \text{Not the same.}$$

$1^2+2^2=5$

$(1+2)^2=9$

#s 19–30 start @ i=1

#s 31–36 Show how the same sum can look different if you start @ i=1, i=0, i=2

#s 37–44 same concept

$$\sum_{k=1}^{7}(3k+5) = \sum_{k=0}^{6}(3(k+1)+5)$$ are the same

$k=1: 3(1)+5$ $k=0: 3(0+1)+5$

§ 8.3 #s 23-44 OMIT

Recall

$S_n = a + ar + ar^2 + \cdots + ar^{n-1}$

$= 5 + 15 + 45 + \cdots + 5 \cdot 3^{n-1}$

$= \sum_{k=1}^{n} 5 \cdot 3^{k-1}$

$= \frac{a(1-r^n)}{1-r}$

$= \frac{5(1-3^n)}{1-3}$ we don't know what n is.

§ 8.3 #s 4, 18, 20*, 46, 50, 54, 58

* subtle

$A = P(1+\frac{r}{n})^{nt}$ is future value of a savings account

r = APR
n = # periods per year
t = # of years
P = principal

\$300 Payments are made into a bank account one each month for 36 months. Interest is 5%, compounded monthly

at the beginning of

$1^{st}: 300(1+\frac{.05}{12})^{12\cdot 3} = 300(1+\frac{.05}{12})^{36}$

$2^{nd}: 300(1+\frac{.05}{12})^{35}$

$3^{rd}: 300(1+\frac{.05}{12})^{34}$ $\qquad \frac{.05}{12} = i$

$\vdots$

$36^{th}: 300(1+\frac{.05}{12})^{1}$

$300(1+i) + 300(1+i)^2 + 300(1+i)^3 + \dots + 300(1+i)^{36}$

$\boxed{a = 300(1+i)}$ $\qquad n = 36$

$r = (1+i)$

This is the 'r' from C 8.

$\frac{a(1-r^n)}{1-r} = \frac{300(1-(1+i)^{36})}{1-(1+i)}$