

We'll drop 4 lowest quizzes

Quiz $y = 3x^2 - 3x + 4$

$$x = \frac{-b}{2a} = \frac{3}{6} = \frac{1}{2}$$

$$\begin{aligned} y &= 3x^2 - 3x + 4 \\ &= 3\left(\frac{1}{2}\right)^2 - 3\left(\frac{1}{2}\right) + 4 \\ &= 3\left(\frac{1}{4}\right) - \frac{3}{2} + 4 \\ &= \frac{3}{4} - \frac{6}{4} + \frac{16}{4} \\ &= \frac{13}{4} \end{aligned}$$

$$(x, y) = \left(\frac{1}{2}, \frac{13}{4}\right)$$

Quiz Tues 26th S.2

Next week is Reading Week (no classes)

S.3 Graphing Rational Functions Cont'd

Ex: $f(x) = \frac{2x^2 - 2x}{x^2 - x - 2}$

1) Intercepts

(0,0) and (1,0)

2) V.A.

$x = 2, x = -1$

3) H.A.

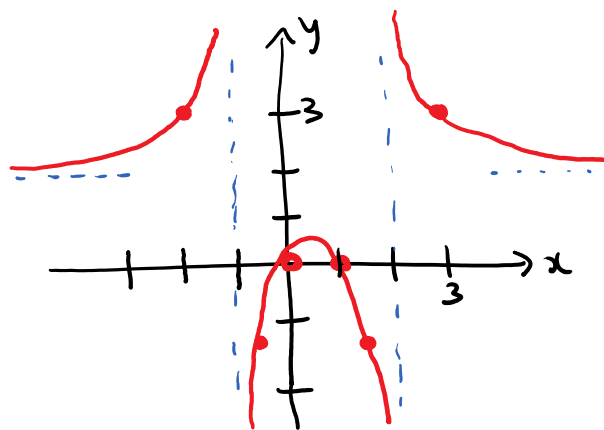
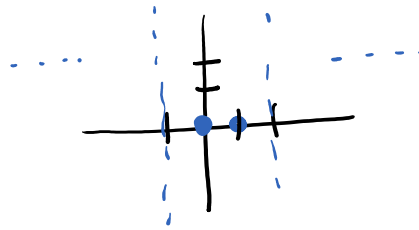
as $x \rightarrow \pm\infty, y \rightarrow \frac{2x^2}{x^2} = 2$

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$$\boxed{\text{H.A. } y=2}$$

4) Table of values

x	$y = \frac{2x^2 - 2x}{x^2 - x - 2}$
-2	3
-0.5	-1.2
1.5	-1.2
3	3



S.4 Polynomial and Rational Inequalities

An algebraic method for inequalities
(no graphing)

Ex: Solve $x^5 \leq 6x^3$

1) Get $y \leq 0$ or $y \geq 0$
(all terms on one side)

$$\underbrace{x^5 - 6x^3}_y \leq 0$$

2) Set $y = 0$

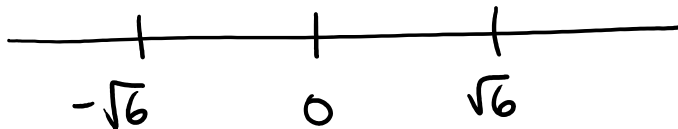
$$x^5 - 6x^3 = 0$$

$$x^3(x^2 - 6) = 0$$

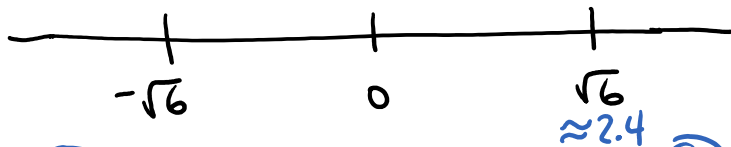
$$\begin{array}{ccc} \downarrow & & \downarrow \\ x=0 & & x^2 - 6 = 0 \\ & & x^2 = 6 \\ & & x = \pm\sqrt{6} \end{array}$$

$$x = 0, \sqrt{6}, -\sqrt{6}$$

These are the only x -values where y can change sign.



Test an x -value in each interval to get the sign of y



$$y = x^5 - 6x^3 \quad \ominus \quad \oplus \quad \ominus \quad \oplus$$

Want $y \leq 0$

Answer: $-\infty < x \leq -\sqrt{6}$ or $0 \leq x \leq \sqrt{6}$

$$(-\infty, -\sqrt{6}] \cup [0, \sqrt{6}]$$