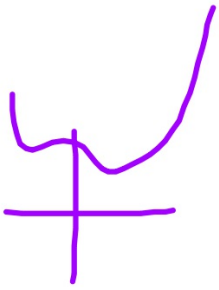
$(x-1)(x+1)$

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

$x-1=0$

$x=1$



$2+\frac{5}{x^2+2}=0$

$\frac{5}{x^2+2}=-2$

$5=-2(x^2+2)$

$5=-2x^2-4$

$9=-2x^2$

$\frac{-9}{2}=x^2$

$\sqrt{\frac{-9}{2}}=\sqrt{x^2}$

$\frac{\pm 3i}{\sqrt{2}}=x$

none

(19) $1-\frac{3}{x-3}=0$

$1=\frac{3}{x-3}$

$x-3=3$

$x=6$

(20) $\frac{x^3-8}{x^2+1}=0$

$x^3-8=0$

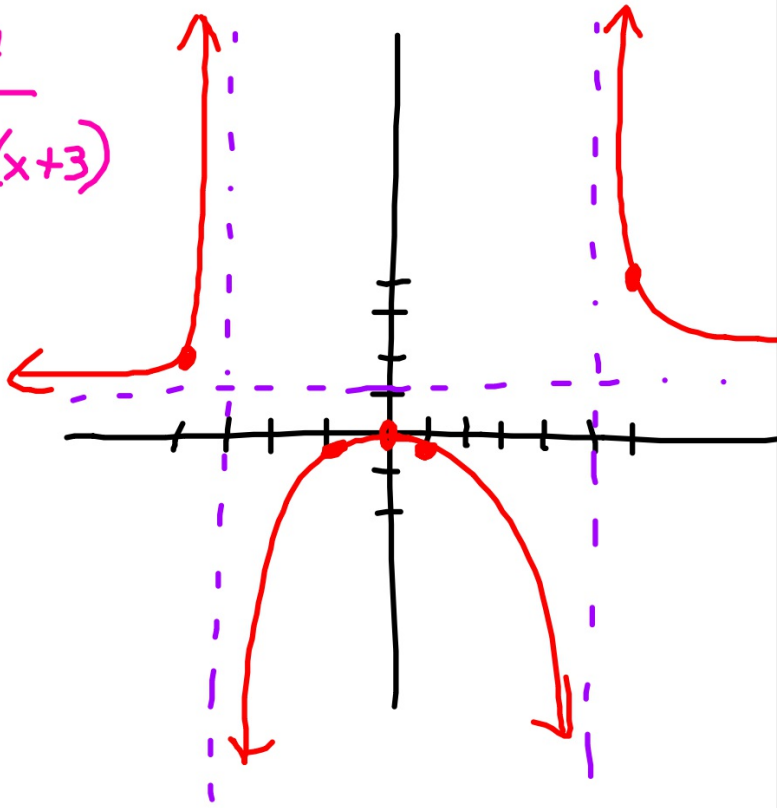
$\sqrt[3]{x^3}=\sqrt[3]{8}$

$x=2$

Rational Example

1) $y = \frac{x^2}{x^2-2x-15} = \frac{x^2}{(x-5)(x+3)}$

Hole: none
VA: $x = 5, -3$
HA: $y = 1$
SA: none



6

) V(1,-4) (2,-3)
h k x y

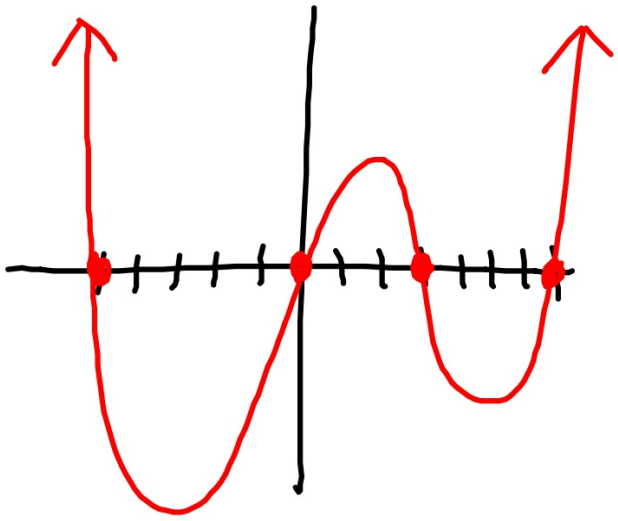
$y = a(x-h)^2 + k$

$= a(2-1)^2 - 4$

$= a(1) - 4$
$+4$

$= a$

$y = 1(x-1)^2 - 4$



pg209-211

) $2x^2+11x-21$

$= \frac{-b}{2a} = \frac{-11}{4} = -2.75$

$2(-2.75)^2+11(-2.75)-21$

-36.125

$-2.75, -36.125)$

$nt: (0,-21)$

$x^2+11x-21=0$ $\quad x=-7, \frac{3}{2}$

$x^2+11x-42=0$

$(x+\frac{14}{2})(x-\frac{3}{2})=0$

$(x+7)(2x-3)=0$

(34) $x(x+3)^2 = y$

y-int: $(0,0)$

x-int: $x=0, -3$ (DR)

(35) $t^3-3t = y$

y-int $(0,0)$

x-int:

$t(t^2-3)=0$

$t=0, \pm\sqrt{3}$

6) $x^3 - 8x^2 = y$

y-int: (0,0)

roots:

$x^2(x-8) = 0$

$x = 0$ (DR), 8

7) $-12x^3 + 20x^2 = y$

y-int: (0,0)

zero

$-4x^2(3x-5) = 0$

$x = 0$ (DR), $\frac{5}{3}$

38) $x^4 - x^3 - 2x^2 = y$

y-int: (0, 0)

zero:

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

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

$x = 0$ (DR), 2, -1

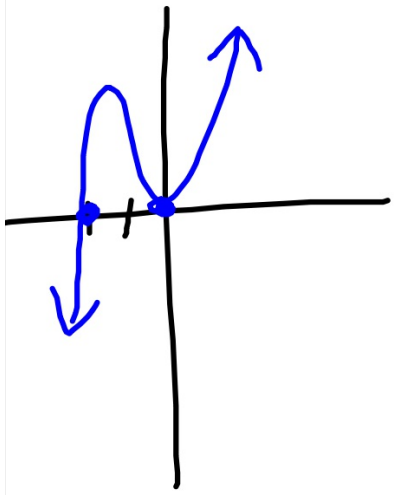
(10) $2x^3+4x^2=y$

y-int: (0,0)

zeros:

$2x^2(x+2)=0$

$x=0$ (DR), -2



(53)

2	6	-4	-27	18	0
		12	16	-22	-8
	6	8	-11	-4	-8

(NO) $6x^3+8x^2-11x-4-\frac{8}{x-}$

(55)

4	2	-19	38	24
		8	-44	-24
	2	-11	-6	0

$2x^2-11x-6$ (Yes)

(92) $3x^3 - 20x^2 + 7x + 30$

$\frac{p}{q}$: $\pm 1, \pm 2, \pm 3, \pm 5, \pm 6, \pm 10, \pm 15, \pm 30$

$\pm\frac{1}{3}, \pm\frac{2}{3}, \pm\frac{5}{3}, \pm\frac{10}{3}$

y-int: (0, 30)

(1) → $3 - 20 + 7 + 30$ X

(-1) → $-3 - 20 - 7 + 30$ ✓

$$\begin{array}{r|rrr} -1 & 3 & -20 & 7 & 30 \\ & & -3 & 23 & -30 \\ \hline & 3 & -23 & 30 & 0 \end{array}$$

$3x^2 - 23x + 30$

$x^2 - 23x + 90$

$(x - \frac{5}{3})(x - \frac{18}{3}) = 0$

$(3x - 5)(x - 6) = 0$

$x = -1, 6, 5/3$