

Mrs. Stichnote

1. $f(x) = (x+4)^2$

a) $(-4, 0)$

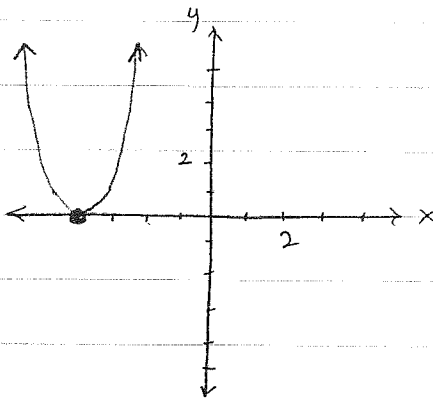
b) $x = -4$

c) $(-\infty, \infty)$

d) $[0, \infty)$

e) $(-4, \infty)$

f) $(-\infty, -4)$



2. $f(x) = \frac{x+2}{x-4}$

Holes: None VA: $x-4=0$ HA: TD BD OA: None
 $x=4$ $y=1$

a) $x=4$ b) $y=1$ c) None d) None

e) x-int
 $(x+10) = \left(\frac{x+2}{x-4}\right)(x-4)$

$0 = x+2$

$-2 = x$

$(-2, 0)$

f) y-int

$y = \frac{x+2}{x-4}$

$y = \frac{0+2}{0-4}$

$y = -\frac{1}{2}$

$(0, -\frac{1}{2})$

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$x-3=0$
 $x=3$

a) NO it is NOT a factor

$3 \mid 1 \quad 4 \quad -3 \quad -12$

$\downarrow 3 \quad 21 \quad 54$

$1 \quad 7 \quad 18 \quad 42 \leftarrow$ B/c of remainder

* Check order of polynomials *

$x+2=0$
 $x=-2$

b) Yes it is a factor

$-2 \mid 4 \quad 8 \quad -9 \quad -18$

$\downarrow -8 \quad 0 \quad 18$

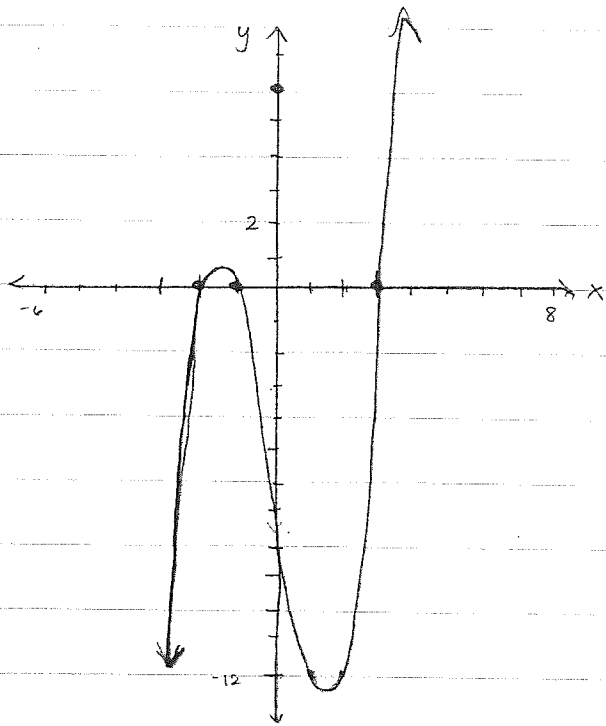
$4 \quad 0 \quad -9 \quad 0 \leftarrow$ B/c of remainder

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4) $f(x) = x^3 - 7x - 6$

x-int: $(-2, 0)$ $(-1, 0)$ $(3, 0)$

y-int: $(0, 6)$



5) $f(x) = 2x^3 + 5x^2 - 11x + 4$

a) $\frac{4}{2} = \frac{\pm 1 \pm 2 \pm 4}{\pm 1 \pm 2}$; $\pm \frac{1}{1}, \pm \frac{1}{2}, \pm \frac{2}{1}, \pm \frac{2}{2}, \pm \frac{4}{1}, \pm \frac{4}{2}$;

$\pm 1, \pm \frac{1}{2}, \pm 2, \pm 4$

b) rational zeros: $1, -4, \frac{1}{2}$

c) $x=1$ $x=-4$ $x=\frac{1}{2}$

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

$f(x) = (x-1)(x+4)(2x-1)$

6) - a)

$-2 \mid 1 \quad 4 \quad 1 \quad -6$

$\downarrow -2 \quad -4 \quad 6$

$1 \quad 2 \quad -3 \quad 0$

$x^2 + 2x - 3$

b)

$4 \mid 3 \quad 0 \quad 5 \quad -2$

$\downarrow 12 \quad 48 \quad 212$

$3 \quad 12 \quad 53 \quad 210$

$3x^2 + 12x + 53 + \frac{210}{x-4}$

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a) (3, 1)

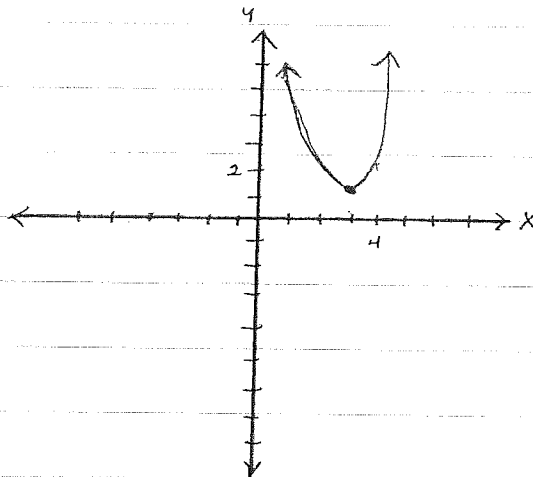
b) $x=3$

c) $(-\infty, \infty)$

d) $[1, \infty)$

e) $(3, \infty)$

f) $(-\infty, 3)$



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a)

$$\begin{array}{r|rrrrr} -3 & 8 & 0 & 0 & -2 & 3 \\ & \downarrow & -24 & 72 & -24 & 654 \\ \hline & 8 & -24 & 72 & -24 & 657 \end{array}$$

$f(-3) = 657$

b)

$$\begin{array}{r|rrr} 1 & 1 & 3 & -4 \\ & \downarrow & 1 & 4 \\ \hline & 1 & 4 & 0 \end{array}$$

$f(1) = 0$

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a) $f(x) = \frac{3x+2}{x-4}$

HA: $x-4=0$
 $x=4$

VA: TD BD
 $1=1$

$y=3=3$
 $y=3$

OA: None

b) $f(x) = \frac{x^2+2}{x-3}$

HA: $x-3=0$
 $x=3$

VA: TD BD
 $\frac{2}{2} \frac{1}{1}$
None

OA: $\begin{array}{r|rrr} 3 & 1 & 0 & 2 \\ & \downarrow & 3 & 9 \\ \hline & 1 & 3 & 11 \end{array}$

$y=x+3$

c) $f(x) = \frac{x-3}{x^2-4}$

HA: $x+2=0$ $x-2=0$
 $x=-2$ $x=2$

VA: TD BD
 $1 < 2$

$y=0$

OA: None

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$$\boxed{10} \quad f(x) = \frac{x-3}{x+5}$$

Holes: None VA: $x+5=0$
 $x=-5$ HA: TD BD OA: None
 $y=1$

$$x\text{-int: } 0 = \frac{x-3}{x+5}$$

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

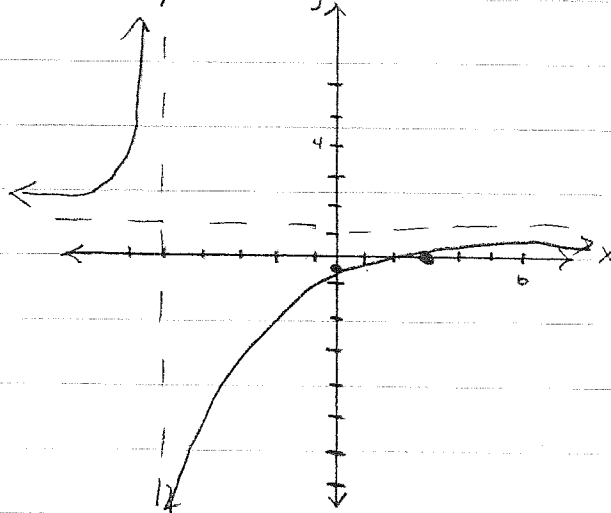
$$0 = x-3$$

$$3 = x$$

$$(3, 0)$$

$$y\text{-int: } y = \frac{0-3}{0+5} \left(0, -\frac{3}{5}\right)$$

$$y = -\frac{3}{5}$$



$$\boxed{11} \quad f(x) = \frac{x^4 - 5x^2 + 4}{x-2} = \boxed{x^3 + 2x^2 - x - 2}$$

$$\begin{array}{r} 2 \overline{) 1 \ 0 \ -5 \ 0 \ 4} \\ \underline{ 2 \ 4 \ -2 \ -4} \\ 1 \ 2 \ -1 \ -2 \ 0 \end{array}$$

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12 $f(x) = 5x^2 + 11$ $k = 2i$ $f(2i) = -9$

$$\begin{array}{r|rrr} 2i & 5 & 0 & 11 \\ & \downarrow & 10i & -20 \\ \hline & 5 & 10i & -9 \end{array}$$

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a) $\swarrow \downarrow$

b) $\uparrow \downarrow$

c) $\uparrow \nearrow$

d) $\swarrow \nearrow$