$$\frac{2}{1} - \frac{3}{x+4} = \frac{12}{x^2+4x}$$

$x(x+4)$ $\quad x(x+4)$ $\quad x(x+4)$

$x(x+4)$

ex. values

$x \neq -4$

$x \neq 0$

LCD

$1 \cdot (x+4)\,x$

$2x(x+4) - 3x = 12$

$2x^2 + 8x - 3x = 12$

$2x^2 + 5x - 12 = 0$

$(2x+8)(2x-3) = 0$

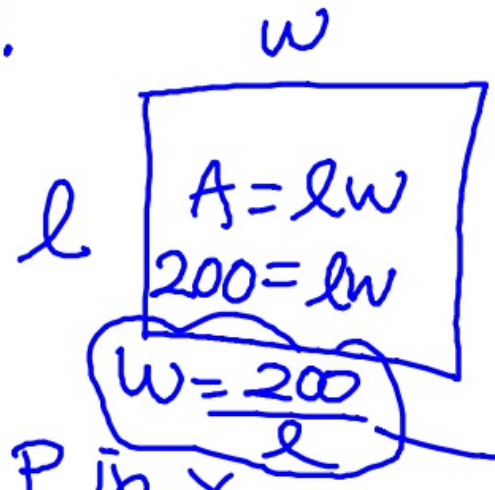
$(x+4)(2x-3) = 0$

-24, 8, -3, 5

$x+4 = 0 \quad 2x-3 = 0$

$x = -4$ $\quad \boxed{x = \frac{3}{2}}$

40.



$A = 200\ m^2$

$x = l$

a) $P = 2l + 2w$

a) P in x

$P = 2l + 2\left(\frac{200}{l}\right)$

b) dims $P = 70m$

$l\,70 = 2l + 400\,l$

$\frac{70}{1} = \frac{2l}{1} + \frac{400}{l}$

$70l = 2l^2 + 400$

$0 = 2l^2 - 70l + 400$

~~$0 = (2l + 80)(2l - 10)$~~

$l = x = \frac{70 \pm \sqrt{4900 - 4(2)(400}}{4}$

$l = +$ ____ m

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

$x(x+1)$

ex.val

$x \neq 0$

$x \neq -1$

LCD

$x(x+1)$

$(x-3)(x+1) - 3x + 3 = 0$

$x^2 - 2x - 3 - 3x + 3 = 0$

$x^2 - 5x = 0$

$x(x-5) = 0$

$x = 0$ $x = 5$

30. $\frac{x}{1} \cdot \frac{x^2}{1} - \frac{3}{x} \cdot x = \frac{7}{1} \cdot x$

ex. val.
$x \neq 0$

LCD
x

$x^3 - 3 = 7x$

$x^3 - 7x - 3 = 0$

$x = -2.4$

$x = -.4$

$x = 2.8$

18. $\frac{x+3}{x} - \frac{2}{x+3} = \frac{6}{x^2+3x}$

$\frac{6}{x(x+3)}$

ex val

$x \neq 0$

$x \neq -3$

LCD

$x(x+3)$

$(x+3)(x+3) - 2x = 6$

$x^2 + 4x + 9 - 6 = 0$

$x^2 + 4x + 3 = 0$

$(x+3)(x+1) = 0$

$x = -3$ $x = -1$

Varies directly

The amount of confusion about a math topic is proportional to the percent of time a student spends sleeping during lesson.

$y = kx$

$C = kS$

$57 = k(75)$

$k = \frac{57}{75}$

$k = .8$

A student that sleeps 75% of the time is confused by 57 scale. What % of time was spent sleeping if scale for conf. is 38.

$C = .8S$

$\frac{38}{.8} = \frac{.8S}{.8}$

$S = 47\%$

Ab Income is inversely proportional to the # of years spent in college.

$$I = \frac{k}{C}$$

$$40000 = \frac{k}{7}$$

$$280000 = k$$

$$I = \frac{280000}{10}$$

Finding Complex zeros

$2x^4+5x^3-x^2+5x-3$

1. put in $y=$ & find a zero

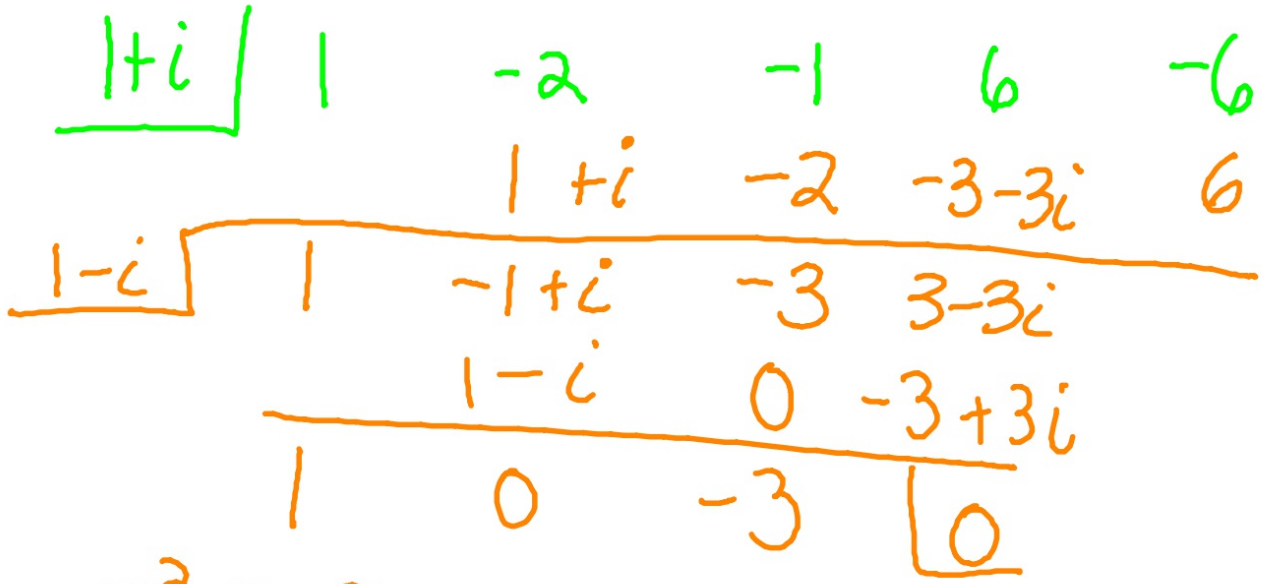
$$\begin{array}{r|rrrrr} -3 & 2 & 5 & -1 & 5 & -3 \\ & & -6 & 3 & -6 & 3 \\ \hline & 2 & -1 & 2 & -1 & 0 \end{array}$$

$x^4 - x^3 - 7x^2 + 6x + 8$

2	1	−1	−7	6	8
		2	2	−10	−8
#	1	1	−5	−4	0

a	1	−1	−12	0

$x^2 - x - 12 = 0$



$x^2 - 3 = 0$

$x = \pm\sqrt{3}$

$$f(x) = \frac{(x-1)\cancel{(x+3)}}{\cancel{(x+3)}(x-4)}$$

D: $(-\infty,-3) \cup (-3,4) \cup (4,$

R: $(-\infty,\frac{4}{7}) \cup (\frac{4}{7},1) \cup$

$(1,\infty)$

hole: $(-3, \frac{+4}{7})$

VA: $x=4$

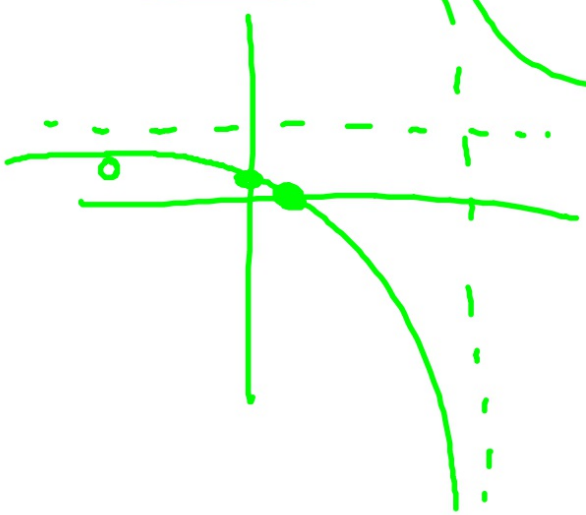
HA: $y=1$

SA: none.

x-int: $x-1=0$

$(1,0)$

y-int $\frac{0-1}{0-4}$ $(0,\frac{1}{4})$



27. $\frac{4x}{x+4} + \frac{5}{x-1} = \frac{15}{x^2+3x-4}$

$\frac{4x(x+4)(x-1)}{x+4} + \frac{5(x+4)(x-1)}{x-1} = \frac{15(x+4)(x-1)}{(x+4)(x-1)}$

ex val

$x \neq -4$

$x \neq 1$

LCD

$(x+4)(x-1)$

$4x(x-1) + 5(x+4) = 15$

$4x^2 - 4x + 5x + 20 - 15 = 0$

$4x^2 + x + 5 = 0$

20

-5×-4

1

$x = \frac{-1 \pm \sqrt{1 - 4(4)(5)}}{8}$

$x = \frac{-1 \pm \sqrt{-79}}{8}$

No Soln

30. $x\frac{x^2}{1} - \frac{3}{x}x = \frac{7}{1}x$

$x \neq 0$
LCD: x

$$x^3 - 3 = 7x$$
$$x^3 - 7x - 3 = 0$$

(39) $\frac{1}{x} = \frac{1}{2.3} + \frac{1}{y}$

$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

$\frac{1}{R} = \frac{1}{x} + \frac{1}{2.3}$

$\frac{1}{R} = \frac{x+2.3}{2.3x}$

$R = \frac{2.3x}{x+2.3}$

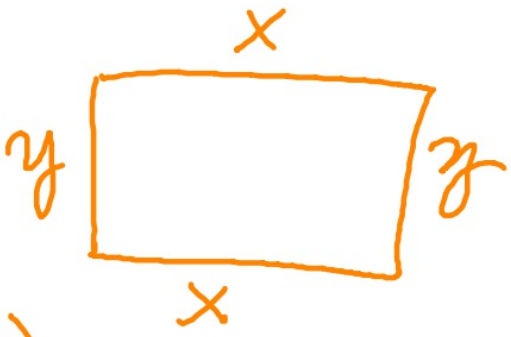
$1.7 = \frac{2.3x}{x+2.3}$

$1.7(x+2.3) = 2.3x$

a) as x

b) $R = 1.7$, $x = ?$

40.



$\ell = x$

$A = 200\ m^2$

$xy = 200$

$y = \frac{200}{x}$

a) $P(x) = 2x + 2y$

$P(x) = 2x + \frac{2}{1}\left(\frac{200}{x}\right)$

$P(x) = 2x + \frac{400}{x}$

b) $x \cdot \frac{70}{1} = \frac{2x}{1} + \frac{400}{x} \cdot x$

$70x = 2x^2 + 400$

$0 = 2x^2 - 70x + 400$

$x = \frac{70 \pm \sqrt{4900 - 4(2)(400}}{4}$

$x = 27.8$ $y =$

$x = 7.2$ $y =$

$$f(x)=\frac{4x}{x^3-9x}$$

(4) $\dfrac{8x^2+26x+15}{2x^2-x-15}$

120
$6\cdot 20$

-30, -6, 5, -1

$(8x+6)(8x+20)$ $\quad (2x-6)(2x+5)$

$$f(x)=\frac{(4x+3)\cancel{(2x+5)}}{(x-3)\cancel{(2x+5)}}$$

hole: $\left(-\frac{5}{2}, \frac{3}{11}\right)$

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

$\dfrac{4(-\frac{5}{2})+3}{-\frac{5}{2}-3}$

VA: $x-3=0$
$x=3$

HA: $y=4$

x-int $\quad 4x+3=0$
$x=-\frac{3}{4}$
$\left(-\frac{3}{4}, 0\right)$

y-int $\quad \dfrac{4(0)+3}{0-3}=-1$
$(0,-1)$

$$f(x) = \frac{x^3 + 8}{x^2 - x - 6}$$

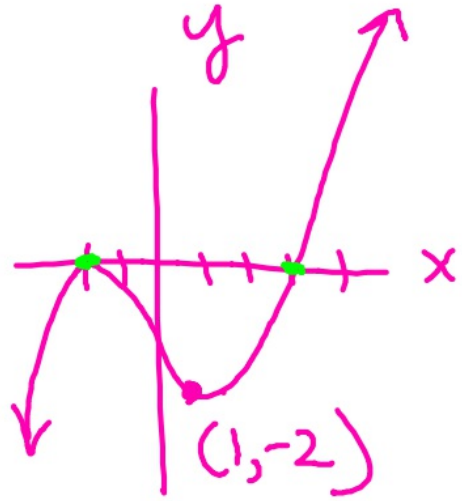
$$\frac{(x+2)(x^2-2x+4)}{(x-3)(x+2)}$$

$3x^4 - 4x^3 + 7x^2 - 10x + 12$

$3, \pm 6i,$

$x = 3 \quad x = 6i \quad x = -6i$

$(x-3)(x-6i)(x+6i)$



$y = a(x+2)(x+2)(x-3)$

$-2 = a(1+2)(1+2)(1-3)$

$-2 = -18a$

$a = \frac{1}{9}$

$y = \frac{1}{9}(x+2)(x+2)(x-3)$

$$4x - 17 + \frac{57x - 24}{x^2 + 3x - 1}$$

$$x^2 + 3x - 1 \;\overline{)\; 4x^3 + 5x^2 + 2x - 7}$$

$$-\,(4x^3 + 12x^2 + 4x)$$

$$-17x^2 + 6x - 7$$

$$+(17x^2 + 51x - 17)$$

$$57x - 24$$