

p 57

$$(28a) f(x) = 3(x+1)(x-2)$$

$\begin{array}{ccc} & \downarrow & \downarrow \\ \text{zeros} & -1 & 2 \end{array}$

$$(28b) \text{ zeros: } 3 \quad ; \quad -4$$

$$y = a(x-3)(x+4)$$

pg 14.  $x^4 - 3x^3 + 5x - 2$

$$(x+2) \rightarrow \text{zeros} = -2$$

$$\begin{array}{r|rrrrr} -2 & 1x^4 & -3 & 0x^2 & 5 & -2 \\ & -2 & & 10 & -20 & 30 \\ \hline & 1 & -5 & 10 & -15 & 28 \end{array}$$

$(x+2)$  is not a factor because  $f(-2) \neq 0$

$$(c) \begin{array}{r|rrrrr} -4 & 1 & -3 & 0 & 5 & -2 \\ & -4 & & 28 & -112 & 428 \\ \hline & 1 & -7 & 28 & -107 & 426 \end{array}$$

$\rightarrow (x+4)$  is not a factor because  $f(-4) \neq 0$

$$\begin{array}{r|rrrrr} 22 & 4x^4 & -4 & -25 & +1 & +6 \\ -2 & & -8 & 24 & 2 & -6 \\ \hline & 4x^3 & -12 & -1 & 3 & 0 \\ 3 & & 12 & 0 & -3 & \\ \hline & 4x^2 & 0x & -1 & 0 & \end{array}$$

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

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

$$\begin{array}{ccc} \downarrow & & \downarrow \\ -\frac{1}{2} & & \frac{1}{2} \end{array}$$

$$b. x-2 \rightarrow \text{zero} = 2$$

$$\begin{array}{r|rrrrr} 2 & 1 & -3 & 0x^2 & 5 & -2 \\ & & 2 & -2 & -4 & 2 \\ \hline & 1 & -1 & -2 & 1 & 0 \end{array}$$

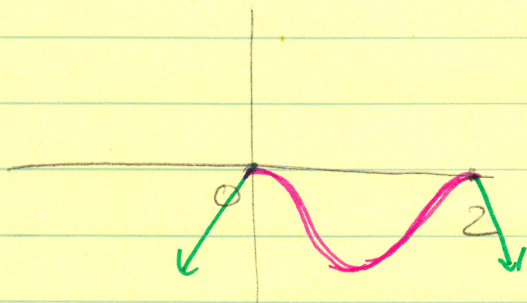
$(x-2)$  is a factor because  $f(2) = 0$

10  $y = -x^2 (2-x)^2$

zeros:  $x^2 \rightarrow 0$  dbl root  $\cup$  or  $\wedge$

$(2-x)^2 \rightarrow 2$  dbl root  $\cup$  or  $\wedge$

$-x^4$ ; highest exp 4: even; neg coef  $\swarrow$   $\searrow$



18  $f(x) = 4x^4 - 24x^3 + 35x^2 + 6x - 9$

3 is a dbl root

$$\begin{array}{r|rrrrr} 3 & 4x^4 & -24 & 35 & 6 & -9 \\ & & 12 & -36 & -3 & 9 \\ \hline & 4x^3 & -12 & -1 & 3 & 0 \end{array}$$

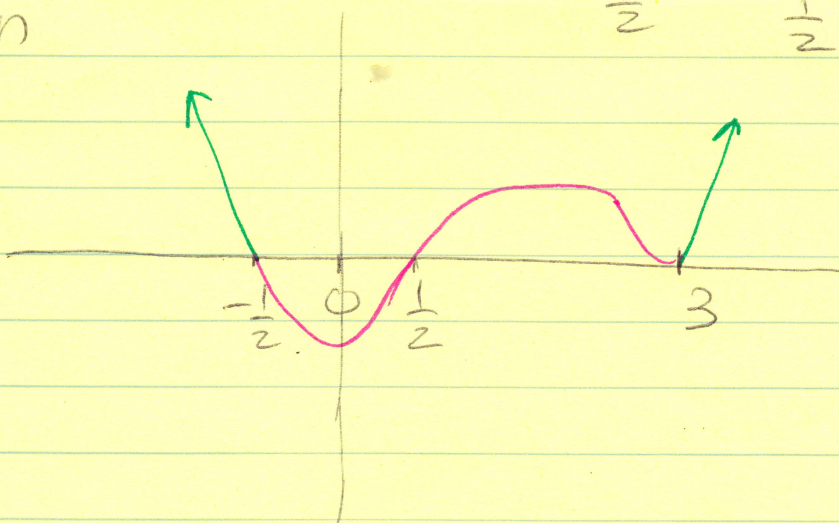
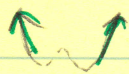
$$\begin{array}{r|rrrr} 3 & 4x^3 & -12 & -1 & 3 \\ & & 12 & 0 & -3 \\ \hline & 4x^2 & 0x & -1 & 0 \end{array}$$

$4x^2 - 1 = 0 \rightarrow (2x+1)(2x-1) = 0$

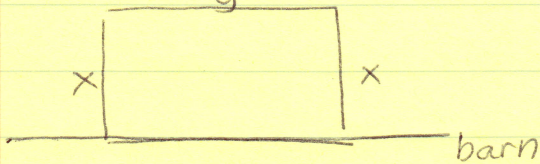
$\downarrow$   $-\frac{1}{2}$        $\downarrow$   $\frac{1}{2}$

Highest exp even

pos coef



①



Fence = 50ft

$x + x + y = 50$

$y = 50 - 2x$

area:  $x(50 - 2x) = -2x^2 + 50x$

zeros: 0 ; 25

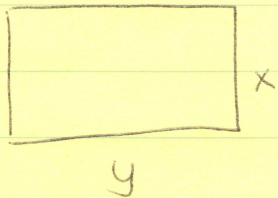
AOS:  $x = \frac{-b}{2a} = \frac{-50}{2(-2)} = +12.5$

Area:  $(+12.5)(50 - 2(+12.5))$

$(+12.5)(50 - 25) = 312.5 \text{ ft}^2$

Dimensions: 12.5 by 25 ft

2.



$2x + 2y = 20$

$y = \frac{20 - 2x}{2} = 10 - x$

Area =  $xy = x(10 - x) = -x^2 + 10x$

AOS:  $x = \frac{-b}{2a} = \frac{-10}{2(-1)} = 5$

Area =  $-x^2 + 10x = -(5)^2 + 10(5) = 25 \text{ in}^2$

3

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

The # =  $-\frac{1}{2}$

AOS:  $x = \frac{-b}{2a} = \frac{-1}{2(1)} = -\frac{1}{2}$

If square =  $\frac{1}{4}$

Product =  $-\frac{1}{2} \cdot \frac{1}{4} = -\frac{1}{8}$



7. new # crates:  $400 + 20x$

 $x = \# \text{ days waited}$ 

new price  $60 - 2x$

new revenue  $f(x) = (400 + 20x)(60 - 2x)$

zeros  $-20 \quad 30$

AOS:  $x = \frac{-20 + 30}{2} = 5$

~~\_\_\_\_\_~~  $\rightarrow$  they should wait 5 days