

$$\underline{X^4 + 2X^2 - 3X - 5}$$

divide

using
synthetic
division

f(x)

$$x + 2 = 0$$

(type in # remainder)

$$\begin{array}{r|rrrrr} -2 & 1 & 0 & 2 & -3 & -5 \\ & & -2 & 4 & -12 & 30 \end{array}$$

$$\underline{1 \quad -2 \quad 6 \quad -15 \quad 25}$$

$$x^3 + 2x^2 + 6x - 15 + \frac{25}{x+2}$$

11.5 (day 2) applications of synthetic div

$$f(x) = \underline{X^4 + 2X^2 - 3X - 5}$$

find

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

$$f(-2) = \textcircled{25}$$

Remainder thm

$f(-2)$ Remainder

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

find $f(3)$ - use the Remainder Theorem
& synthetic div

$$\begin{array}{r|rrrr}
 3 & 1 & -4 & 5 & -3 \\
 & & 3 & -3 & 6 \\
 \hline
 & 1 & -1 & 2 & 3
 \end{array}$$

$$f(3) = 3$$

$$f(x) = x^5 - 2x^4 + 3x - 1$$

$f(-2)$ using Remainder Thm

$$\begin{array}{r|rrrrrr} -2 & 1 & -2 & 0 & 0 & 3 & -1 \\ & & -2 & 8 & -16 & 32 & -70 \\ \hline & 1 & -4 & 8 & -16 & 35 & -71 \end{array}$$

$$f(-2) = -71$$

Solve (2)

$$X - 2x - 8 = 0 \rightarrow$$

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

$$X - 4 = 0 \quad \text{or} \quad x + 2 = 0$$

$$X = 4$$

$$\boxed{\text{or}} \quad X = -2$$

$$f(x) = X^2 - 2x - 8$$

$$f(4) = 0$$

$$\begin{array}{r} 4 \overline{) 1 \quad -2 \quad -8} \\ \underline{ } \\ 1 \quad 2 \quad 0 \end{array}$$

$$\textcircled{3} \quad X^3 - 4X^2 + X + 6 = 0 \quad \text{Solve}$$

show that $X = -1$ is a soln & finishing solution

$$\begin{array}{r|rrrr}
 X+1 & 1 & -4 & 1 & 6 \\
 & \downarrow & & & \\
 & 1 & -5 & 6 & 0
 \end{array}$$

$$X^3 - 4X^2 + X + 6 = 0$$

$$(X+1)(X^2 - 5X + 6) = 0$$

$$(X+1)(X-2)(X-3) = 0$$

$$X = -1, X = 2, X = 3$$

$$2x^3 - 5x^2 + x + 2 = 0 ; \textcircled{2}$$

show \checkmark 2 is a soln of ~~finishing~~ solving

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

$$\begin{aligned}
 (x-2)(2x^2-x-1) &= 0 \\
 (x-2)(2x+1)(x-1) &= 0
 \end{aligned}$$

$$x=2, x=-\frac{1}{2}, x=1$$

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

$$6x^3 + 25x^2 - 24x + 5 = 0; \quad -5$$

show -5 is a soln & Solve

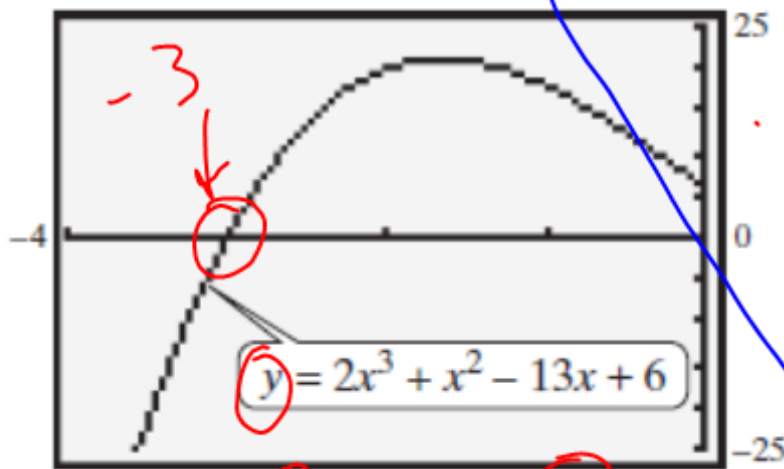
-5	6	25	-24	5
		-30	25	-5
	6	-5	1	0

$$(x+5)(6x^2 - 5x + 1) = 0$$

$$(x+5)(2x-1)(3x-1) = 0$$

$$x = -5, x = \frac{1}{2}, \frac{1}{3}$$

34. $2x^3 + x^2 - 13x + 6 = 0$



$x = -3$
 finish solving

$[-4, 0, 1]$ by $[-25, 25, 5]$

x

$$\begin{array}{r}
 -3 \overline{) 2 \quad 1 \quad -13 \quad 6} \\
 \underline{2 \quad -6 \quad -13 \quad 6} \\
 2 \quad -5 \quad 2 \quad 0
 \end{array}$$

$$\begin{aligned}
 (x+3)(2x^2-5x+2) &= 0 \\
 (x+3)(2x-1)(x-2) &= 0 \\
 x &= -3 \quad x = \frac{1}{2} \quad x = 2
 \end{aligned}$$

