

Ch. 5 Review

Given zeros are 5, -5, 5i, -5i,
write the polynomial.

$$f(x) = (x-5)(x+5)(x-5i)(x+5i)$$

$$(x^2+5x-5x-25)(x^2+5ix-5ix+25)$$

$$(x^2-25)(x^2+25)$$

$$x^4 + 25x^2 - 25x^2 - 625$$

$$f(x) = x^4 - 625$$

- Write in factored form.

a. $y = -3x^3 - 3x^2 + 90x$

$$y = -3x(x^2 + x - 30)$$

$$y = -3x(x-5)(x+6)$$

b. $y = x^3 + 8x^2 + 9x + 72$

$$y = x^2(x+8) + 9(x+8)$$

$$y = (x^2+9)(x+8)$$

Solve by factoring.

a. $5x^2 + 7x - 66 = 0$ $a \cdot c = 5 \cdot 66 = -330$

$$5x^2 - 15x + 22x - 66 = 0$$

$$5x(x-3) + 22(x-3) = 0$$

$$(x-3)(5x+22) = 0$$

1:330
2:165
3:110
5:66
6:55
10:33
11:30
-15:22

$$\boxed{x=3} \quad \frac{5x+22=0}{-22 \quad -22}$$

$$\frac{5x}{5} = \frac{-22}{5} \quad \boxed{x = -\frac{22}{5}}$$

b. $x^4 - 5x^2 = -4$

$$\frac{x^4 - 5x^2 + 4}{+4 \quad +4} = 0$$

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

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

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

$$x = -1, 1, -2, 2$$

Write in factored form .

$$x^3 - 3x^2 - 28x$$

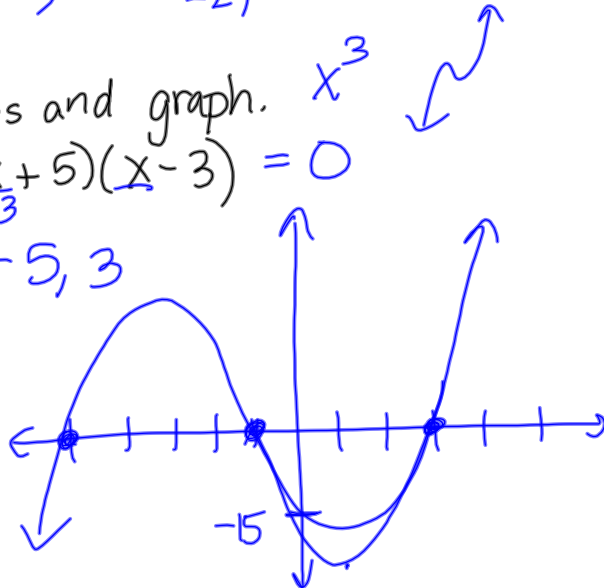
$$x(x^2 - 3x - 28) \begin{matrix} 1 \cdot 28 \\ 2 \cdot 14 \\ 4 \cdot 7 \end{matrix}$$

$$x(x+4)(x-7) \quad \begin{matrix} 2 \cdot 6 \cdot 2 \\ -24 \end{matrix}$$

Find the zeros and graph.

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

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



Write polynomial given zeros $x=1, -2, -5$.
standard form

factor $(x - b) = 0$

$x = b$ zero

$3 \cdot 7 \cdot 2$
 $(2) \cdot x$
 4^2

$$f(x) = (x - 1)(x - (-2))(x - (-5))$$

$$= (x - 1)(x + 2)(x + 5) \text{ factored form}$$

$$x^2 + 2x - 1x - 2$$

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

$$\begin{matrix} x^3 + x^2 - 2x \\ + 5x^2 + 5x - 10 \end{matrix}$$

$$\begin{matrix} x^3 + 5x^2 \\ x^2 + 5x \\ -2x - 10 \end{matrix}$$

$$f(x) = x^3 + 6x^2 + 3x - 10$$

Long division.

$$(x^3 + 3x^2 + x + 2) \div (x - 1)$$

$$\begin{array}{r}
 x^2 + 4x + 5 + \frac{7}{x-1} \\
 \hline
 \overline{) x^3 + 3x^2 + x + 2} \\
 \underline{-x^3 + x^2} \\
 4x^2 + x \\
 \underline{-4x^2 + 4x} \\
 5x + 2 \\
 \underline{-5x + 5} \\
 7 \quad R7
 \end{array}$$

Is $x+4$ a factor of $x^3 + 9x^2 + 11x - 44$?

	$\overset{3}{x}$	$\overset{2}{x}$	$\overset{1}{x}$	$\overset{0}{x}$	
-4	1	9	11	-44	
		-4	-20	36	
	1	5	-9	-8	\rightarrow not 0, so not a factor.

but $P(-4) = -8$