

Name: _____ Per: _____ Date: _____
Serafino • Algebra II

4B – SC Polynomials
Factoring methods

Factor, find ALL solutions, and sketch, with x and y intercepts

1. $f(x) = x^3 + 4x^2 - 2x - 8$

a) Fully factored

c) Sketch

b) All solutions to $f(x) = 0$:

2. $f(x) = -x^4 + 4x^2 + 32$

a) Fully factored

c) Sketch

b) All solutions to $f(x) = 0$:

3. $f(x) = 16x^5 - 2x^2$

a) Fully factored

c) Sketch

b) All solutions to $f(x) = 0$:

4. In $f(x) = x^4 - 10x^3 + 13x^2 + 24x$, one factor is given. $f(x) = \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} (x - 8)$
Use synthetic division / factoring to find the other three.

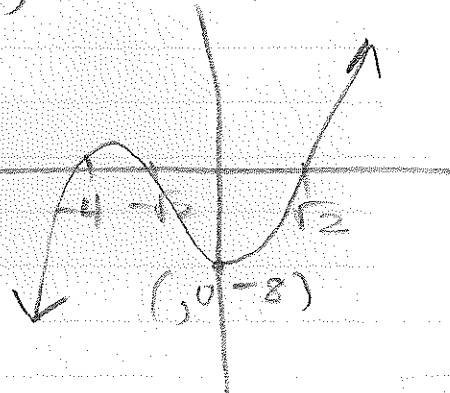
4B Skills Check Key

1. $f(x) = (x^3 + 4x^2) - 2x(-8)$

a) Factor: $x^2(x+4) - 2(x+4)$

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

b) $f(x) = 0 \rightarrow x^2 - 2 = 0$
 $x = -4, \sqrt{2}, -\sqrt{2}$
 $\sqrt{x^2} = \sqrt{2}$
 $\pm\sqrt{2}$



2. $f(x) = -x^4 + 4x^2 + 32$

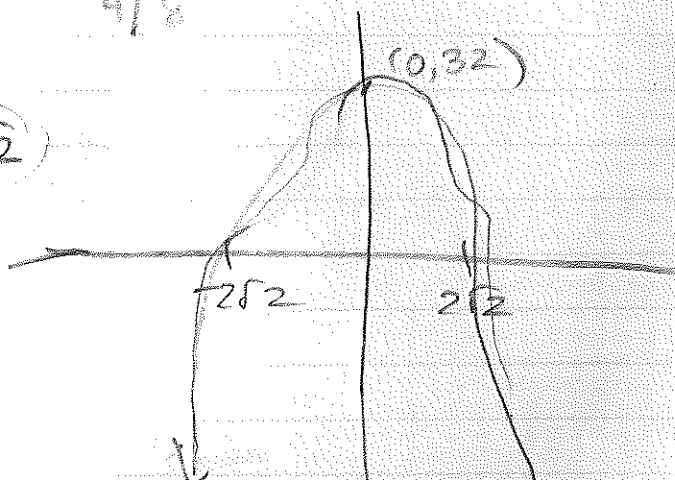
$- [x^4 - 4x^2 - 32]$

a) $f(x) = -(x^2 + 4)(x^2 - 8)$

b) $2i, -2i, \sqrt{2}, -\sqrt{2}$

$x^2 + 4 = 0$
 $\sqrt{x^2} = \sqrt{-4}$
 $\pm 2i$

$$\begin{array}{r} -32 \\ 1 \overline{) 32} \\ 2 \overline{) 16} \\ 4 \overline{) 8} \end{array}$$



$$f(x) = 16x^5 - 2x^2$$

$$2x^2(8x^3 - 1) \quad \begin{matrix} a=2x \\ b=1 \end{matrix}$$

$$2x^2(2x-1)(4x^2+2x+1)$$

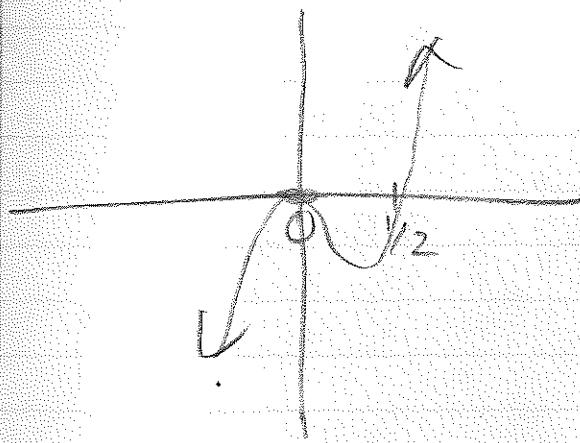
$$x = 0^{(2)} \quad 1/2$$

$$\frac{-2 \pm \sqrt{4 - 4(4)(1)}}{2(4)}$$

$$\frac{-2 \pm \sqrt{-12}}{8} < \frac{4}{3}$$

$$\frac{-2 \pm 2i\sqrt{3}}{8} = \frac{-1 \pm i\sqrt{3}}{4}$$

$$\frac{-1}{4} \pm \frac{i\sqrt{3}}{4}$$



4. $x^4 - 10x^3 + 13x^2 + 24x$

$$f(x) = x(x-3)(x+1)(x-8)$$

$$(x^3 - 10x^2 + 13x + 24)$$

8		1	-10	13	24
			8	-16	-24
		1	-2	-3	0
		x^2	x	c	R

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

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