

Sec 3.4

Solving Polynomials

-new today-

beyond cubic...need to use synthetic
division more than once

$$x^4 - 6x^2 - 8x + 24 = 0$$

$$\begin{array}{r|rrrrr}
 2 & 1 & 0 & -6 & -8 & 24 \\
 & & 2 & 4 & -4 & -24 \\
 \hline
 & 1 & 2 & -2 & -12 & 0
 \end{array}$$

$$(x-2)(x^3 + 2x^2 - 2x - 12) = 0$$

$$\begin{array}{r|rrrr}
 2 & 1 & 2 & -2 & -12 \\
 & & 2 & 8 & 12 \\
 \hline
 & 1 & 4 & 6 & 0
 \end{array}$$


$$(x-2)(x-2)(x^2 + 4x + 6) = 0$$

$$x = \frac{-4 \pm \sqrt{16 - 24}}{2}$$

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

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

$$= -2 \pm i\sqrt{2}$$



Suggested Practice
Sec 3.4
page 387
17,19,20,23,24

17. a) 1, 2, 3, 4, 6, 12

Solns

$$\{-3, 1, 4\}$$

19. a) 1, 2, 3, 4, 6, 12

$$\{-2, 1 \pm \sqrt{7}\}$$

20. a) $\pm 1, \pm 13$

b/c) $\{1, 2 \pm 3i\}$

23. a) 1, 2, 4

b/c)

$$\{\pm 2, 1 \pm \sqrt{2}\}$$

24. a) $\pm 1, \pm 3, \pm 5, \pm 15$

b) -1 or 3

c) $\{-1, 3, 1 \pm 2i\}$