

pg. 324 # 12-32

SOAP  
Same Opposite Always Positive

12.  $x^3 + 64$      $a=x$      $b=4$

$$\boxed{(x+4)(x^2 - 4x + 16)}$$

15.  $x^3 - 27 = 0$      $a=x$      $b=3$

$$(x-3)(x^2 + 3x + 9)$$

↓

↓ can't factor

$$\boxed{x=3} \quad x = \frac{-3 \pm \sqrt{3^2 - 4(1)(9)}}{2(1)} = \frac{-3 \pm \sqrt{9-36}}{2}$$

$$= \frac{-3 \pm \sqrt{-27}}{2}$$

$$\boxed{x = \frac{-3 \pm 3i\sqrt{3}}{2}}$$

21.  $x^4 - 8x^2 + 7$

$$\begin{array}{c} \cancel{7} \\ \cancel{-7} \quad \cancel{-1} \\ \cancel{-8} \end{array}$$

	$x^2$	$-7$
$x^2$	$x^4$	$-7x^2$
$-1$	$-x^2$	$7$

D2D

$$(x^2 - 1)(x^2 - 7)$$

$$\boxed{(x+1)(x-1)(x^2 - 7)}$$

27.  $x^4 - 10x^2 + 9 = 0$

~~$\begin{array}{c} 9 \\ -1 \quad -9 \\ -10 \end{array}$~~

	$x^2$	$x^2$	$-1$
$x^2$	$x^4$	$-x^2$	
$-9$	$-9x^2$	$9$	

D2□      D2□

$$(x^2 - 1)(x^2 - 9) = 0$$

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

$x = -1$	$x = 1$	$x = -3$	$x = 3$
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5. 0, -1, -2

6. 0, -3.5, 1

7. 0, -0.5, 1.5

8. -0.5, 0, 3

9. 1, 7

10. 4.8%

11. about 5.78 ft × 6.78 ft × 1.78 ft

12.  $(x + 4)(x^2 - 4x + 16)$

13.  $(x - 10)(x^2 + 10x + 100)$

14.  $(5x - 3)(25x^2 + 15x + 9)$

15.  $3, \frac{-3 \pm 3i\sqrt{3}}{2}$

16.  $-4, 2 \pm 2i\sqrt{3}$

17.  $5, \frac{-5 \pm 5i\sqrt{3}}{2}$

18.  $-1, \frac{1 \pm i\sqrt{3}}{2}$

19.  $\frac{1}{2}, \frac{-1 \pm i\sqrt{3}}{4}$

20.  $-\frac{1}{2}, \frac{1 \pm i\sqrt{3}}{4}$

21.  $(x^2 - 7)(x - 1)(x + 1)$

22.  $(x^2 + 10)(x^2 - 2)$

23.  $(x^2 - 3)(x - 2)(x + 2)$

24.  $(x - 2)(x + 2)(x - 1)(x + 1)$

25.  $(x - 1)(x + 1)(x^2 + 1)$

26.  $2(2x^2 - 1)(x + 1)(x - 1)$

27.  $\pm 3, \pm 1$

28.  $\pm 2$

29.  $\pm 4, \pm 2i$

30.  $\pm 3i, \pm \sqrt{2}$

31.  $\pm \sqrt{2}, \pm i\sqrt{6}$

32.  $\pm i\sqrt{5}, \pm i\sqrt{3}$

33. -1, 3.24, -1.24

34. -9, 0

35. -2, -3, 1, 2

36. 1.71, 0.83

37. 0, 1.54, 8.46

38. 0, 1.27, 4.73

21