

129. Verbal model:

First even integer	·	Second even	=	224
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Labels:

First even integer = $2n$

Second even integer = $2n + 2$

Equation:

$$2n \cdot (2n + 2) = 224$$

$$4n^2 + 4n - 224 = 0$$

$$4(n^2 + n - 56) = 0$$

$$4(n + 8)(n - 7) = 0$$

$$n + 8 = 0 \quad n - 7 = 0$$

$$n = -8 \quad n = 7$$

reject $2n = 14$

$$2n + 2 = 16$$

Chapter Test for Chapter 3

1. $-5.2x^3 + 3x^2 - 8$

Degree = 3 Leading coefficient = -5.2

3. (a) $(5a^2 - 3a + 4) + (a^2 - 4) = 6a^2 - 3a$

4. (a) $-2(2x^4 - 5) + 4x(x^3 + 2x - 1)$
 $= -4x^4 - 10 + 4x^4 + 8x^2 - 4x$
 $= 8x^2 - 4x + 10$

5. (a) $(-2u^2v)^3(3v^2) = (-8u^6v^3)(3v^2)$
 $= -24u^6v^5$

6. (a) $2y\left(\frac{y}{4}\right)^2 = 2y\left(\frac{y^2}{16}\right)$
 $= \frac{y^3}{8}$

7. (a) $-3x(x - 4) = -3x^2 + 12x$

8. (a) $(x - 1)[2x + (x - 3)] = (x - 1)(3x - 3) = 3x^2 - 6x + 3$

(b) $(2s - 3)(3s^2 - 4s + 7) = 6s^3 - 8s^2 + 14s - 9s^2 + 12s - 21$
 $= 6s^3 - 17s^2 + 26s - 21$

2. $\frac{4}{x^2 + 2}$ is not a polynomial because the variable appears in the denominator.

(b) $(16 - y^2) - (16 + 2y + y^2)$
 $= 16 - y^2 - 16 - 2y - y^2$
 $= -2y^2 - 2y$

(b) $4t - [3t - (10t + 7)] = 4t - [3t - 10t - 7]$
 $= 4t - 3t + 10t + 7$
 $= 11t + 7$

(b) $3(5x)(2xy)^2 = 3(5x)(4x^2y^2)$
 $= 60x^3y^2$

(b) $\frac{(-3x^2y)^4}{6x^2} = \frac{81x^8y^4}{6x^2}$
 $= \frac{27x^6y^4}{2}$

(b) $(2x - 3y)(x + 5y) = 2x^2 + 7xy - 15y^2$

9. (a) $(4x - 3)^2 = 16x^2 - 24x + 9$

(b) $[4 - (a + b)][4 + (a + b)] = 16 - (a + b)^2$
 $= 16 - (a^2 + 2ab + b^2)$
 $= 16 - a^2 - 2ab - b^2$

10. $18y^2 - 12y = 6y(3y - 2)$

11. $v^2 - \frac{16}{9} = (v - \frac{4}{3})(v + \frac{4}{3})$

12. $x^3 - 3x^2 - 4x + 12 = x^2(x - 3) - 4(x - 3)$
 $= (x - 3)(x^2 - 4)$
 $= (x - 3)(x - 2)(x + 2)$

13. $9u^2 - 6u + 1 = (3u - 1)(3u - 1)$ or $(3u - 1)^2$

14. $6x^2 - 26x - 20 = 2(3x^2 - 13x - 10)$
 $= 2(3x + 2)(x - 5)$

15. $x^3 + 27 = (x + 3)(x^2 - 3x + 9)$

16. $(y + 2)^2 - 9 = 0$
 $[(y + 2) - 3][(y + 2) + 3] = 0$
 $y - 1 = 0$ $y + 5 = 0$
 $y = 1$ $y = -5$

17. $12 + 5y - 3y^2 = 0$

$(3 - y)(4 + 3y) = 0$

$3 - y = 0$ $4 + 3y = 0$

$3 = y$ $-\frac{4}{3} = y$

18. Area = $2x(x + 15) - x(x + 4)$

Shaded region = $2x^2 + 30x - x^2 - 4x$
 $= x^2 + 26x$

19. Verbal model:

Area rectangle

 =

Length

 ·

Width

Labels: Length = $\frac{3}{2}w$

Width = w

Equation: $54 = \frac{3}{2}w \cdot w$

$108 = 3w^2$

$36 = w^2$

6 centimeters = width

9 centimeters = length

20. $0 = -16t^2 - 40t + 144$

$0 = 2t^2 + 5t - 18$

$0 = (2t + 9)(t - 2)$

$2t + 9 = 0$ $t - 2 = 0$

$t = -\frac{9}{2}$ $t = 2$ sec

reject

21. Verbal model: $\boxed{\text{Area}} = \frac{1}{2} \cdot \boxed{\text{Base}} \cdot \boxed{\text{Height}}$

Labels: Base = x

Height = $2x + 4$

Equation: $35 = \frac{1}{2} \cdot x \cdot (2x + 4)$

$70 = 2x^2 + 4x$

$0 = 2x^2 + 4x - 70$

$0 = x^2 + 2x - 35$

$0 = (x + 7)(x - 5)$

$x + 7 = 0$

$x = -7$

reject

$x - 5 = 0$

$x = 5$ feet; base

$2x + 4 = 14$ feet; height

Cumulative Test for Chapters P–3

1. (a) $-2 < 5$

(b) $\frac{1}{3} < \frac{1}{2}$

(c) $|2.3| > -|-4.5|$

3. (a) $t(3t - 1) - 2t(t + 4) = 3t^2 - t - 2t^2 - 8t$
 $= t^2 - 9t$

(b) $3x(x^2 - 2) - x(x^2 + 5) = 3x^3 - 6x - x^3 - 5x$
 $= 2x^3 - 11x$

5. (a) $(2x + 1)(x - 5) = 2x^2 - 10x + x - 5$
 $= 2x^2 - 9x - 5$

(b) $[2 + (x - y)]^2 = 4 + 4(x - y) + (x - y)^2$
 $= 4 + 4x - 4y + x^2 - 2xy + y^2$

6. (a) $12 - 5(3 - x) = x + 3$

$12 - 15 + 5x = x + 3$

$-3 + 5x = x + 3$

$-3 + 5x - x = x + 3 - x$

$3 - 3 + 4x = 3 + 3$

$4x = 6$

$\frac{4x}{4} = \frac{6}{4}$

$x = \frac{3}{2}$

2. "The number n is tripled and the product is decreased by 8," is expressed by $3n - 8$.

4. (a) $(2a^2b)^3(-ab^2)^2 = (8a^6b^3)(a^2b^4)$
 $= 8a^8b^7$

(b) $\left(\frac{2x^4y^2}{4x^3y}\right)^2 = \left(\frac{xy}{2}\right)^2 = \frac{x^2y^2}{4}$

(b) $1 - \frac{x + 2}{4} = \frac{7}{8}$

$8\left[1 - \frac{x + 2}{4}\right] = \left[\frac{7}{8}\right]8$

$8 - 2(x + 2) = 7$

$8 - 2x - 4 = 7$

$4 - 2x = 7$

$4 - 4 - 2x = 7 - 4$

$-2x = 3$

$\frac{-2x}{-2} = \frac{3}{-2}$

$x = -\frac{3}{2}$