

Mid-Chapter Quiz for Chapter 3

1. degree = 4
leading coefficient = -2
2. $2x - 3x^{1/2} + 5$ is not a polynomial because the term $-3x^{1/2}$ has degree $\frac{1}{2}$. The degree of the variable x is not an integer.
3. $(2t^3 + 3t^2 - 2) + (t^3 + 9) = 3t^3 + 3t^2 + 7$
4. $(3 - 7y) + (7y^2 + 2y - 3) = 7y^2 - 5y$
5. $(7x^3 - 3x^2 + 1) - (x^2 - 2x^3) = 7x^3 - 3x^2 + 1 - x^2 + 2x^3 = 9x^3 - 4x^2 + 1$
6. $(5 - u) - 2[3 - (u^2 + 1)] = (5 - u) - 2[3 - u^2 - 1] = (5 - u) - 2[2 - u^2] = 5 - u - 4 + 2u^2 = 2u^2 - u + 1$
7. $(-5n^2)(-2n^3) = 10n^5$
8. $(-2x^2)^3(x^4) = (-2)^3(x^2)^3(x^4) = -8x^6 \cdot x^4 = -8x^{10}$
9. $\frac{6x^7}{(-2x^2)^3} = \frac{6x^7}{-8x^6} = -\frac{3x}{4}$
10. $\left(\frac{4y^2}{5x}\right) = \left(\frac{4y^2}{5x}\right)\left(\frac{4y^2}{5x}\right) = \frac{16y^4}{25x^2}$
11. $7y(4 - 3y) = 28y - 21y^2$
12. $(x - 7)(x + 3) = x^2 + 3x - 7x - 21 = x^2 - 4x - 21$
13. $(4x - y)(6x - 5y) = 24x^2 - 20xy - 6xy + 5y^2 = 24x^2 - 26xy + 5y^2$
14. $2z(z + 5) - 7(z + 5) = 2z^2 + 10z - 7z - 35 = 2z^2 + 3z - 35$
15. $(6r + 5)(6r - 5) = 36r^2 - 25$
16. $(2x - 3)^2 = (2x - 3)(2x - 3) = 4x^2 - 12x + 9$
17. $(x + 1)(x^2 - x + 1) = x^3 - x^2 + x + x^2 - x + 1 = x^3 + 1$
18. $(x^2 - 3x + 2)(x^2 + 5x - 10) = x^2(x^2 + 5x - 10) - 3x(x^2 + 5x - 10) + 2(x^2 + 5x - 10) = x^4 + 5x^3 - 10x^2 - 3x^3 - 15x^2 + 30x + 2x^2 + 10x - 20 = x^4 + 2x^3 - 23x^2 + 40x - 20$
19. $28a^2 - 21a = 7a(4a - 3)$
20. $25 - 4x^2 = (5 - 2x)(5 + 2x)$
21. $z^3 + 3z^2 - 9z - 27 = z^2(z + 3) - 9(z + 3) = (z + 3)(z^2 - 9) = (z + 3)(z + 3)(z - 3) = (z + 3)^2(z - 3)$
22. $4y^3 - 32x^3 = 4(y^3 - 8x^3) = 4[y^3 - (2x)^3] = 4(y - 2x)(y^2 + 2xy + 4x^2)$

$$\begin{array}{ll}
 \mathbf{23.} & (5x + 10)(2x + 1) & (5x - 10)(2x - 1) \\
 & (5x + 1)(2x + 10) & (5x - 1)(2x - 10) \\
 & (5x + 2)(2x + 5) & (5x - 2)(2x - 5) \\
 & (5x + 5)(2x + 2) & (5x - 5)(2x - 2)
 \end{array}$$

24. Verbal model:

Area of shaded region	=	Area of large triangle	-	Area of small triangle
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Equation:

$$\begin{aligned}
 A &= \frac{1}{2}(x + 2)^2 - \frac{1}{2}x^2 \\
 &= \frac{1}{2}(x^2 + 4x + 4) - \frac{1}{2}x^2 \\
 &= \frac{1}{2}x^2 + 2x + 2 - \frac{1}{2}x^2 \\
 &= 2x + 2
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{25.} \quad h(1) &= -16(1)^2 - 5(1) + 100 \\
 &= -16 - 5 + 100 \\
 &= 79 \text{ feet} \\
 h(2) &= -16(2)^2 - 5(2) + 100 \\
 &= -16(4) - 10 + 100 \\
 &= -64 + 90 \\
 &= 26 \text{ feet}
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{26.} \quad P(x) &= R(x) - C(x) \\
 &= 19x - (5x + 2000) \\
 &= 19x - 5x - 2000 \\
 &= 14x - 2000 \\
 P(1000) &= 14(1000) - 2000 = \$12,000
 \end{aligned}$$

Section 3.4 Factoring Trinomials

$$\begin{array}{ll}
 \mathbf{1.} & x^2 + 4x + 4 = x^2 + 2(2x) + 2^2 = (x + 2)^2 \\
 \mathbf{3.} & a^2 - 12a + 36 = a^2 - 2(6a) + 6^2 = (a - 6)^2 \\
 \mathbf{5.} & 25y^2 - 10y + 1 = (5y)^2 - 2(5y) + 1 = (5y - 1)^2 \\
 \mathbf{7.} & 9b^2 + 12b + 4 = (3b)^2 + 2(3b)(2) + 2^2 = (3b + 2)^2 \\
 \mathbf{9.} & u^2 + 8uv + 16v^2 = u^2 + 2(4uv) + (4v)^2 = (u + 4v)^2 \\
 \mathbf{11.} & 36x^2 - 60xy + 25y^2 = (6x)^2 - 2(6x)(5y) + (5y)^2 = (6x - 5y)^2 \\
 \mathbf{13.} & 5x^2 + 30x + 45 = 5(x^2 + 6x + 9) = 5[x^2 + 2(3)(x) + 3^2] = 5(x + 3)^2 \\
 \mathbf{15.} & 2x^2 + 24x^2 + 72x = 2x(x^2 + 12x + 36) = 2x[x^2 + 2(6)x + 6^2] = 2x(x + 6)^2 \\
 \mathbf{17.} & 20v^4 - 60v^3 + 45v^2 = 5v^2(4v^2 - 12v + 9) = 5v^2[(2v)^2 - 2(2v)(3) + 3^2] = 5v^2(2v - 3)^2
 \end{array}$$