CHAPTER 6 ANSWERS

PROBLEM SET 6-1AND 6-2

1. $2x^3 + 9x^2 + 5x + 27$; polynomial of 4 terms

2. $80x^3 - 109x^2 + 7x - 75$; polynomial of 4 terms

3. $10a^2 - 3ab + 10$; trinomial

4. $8x^3 + 2x^2$; binomial

5. $b^3 - 6b^2 + 9b$; trinomial

6. $x^4 + 2x^2 + 1$; trinomial

7. $x^3 - 6x^2 + 12x - 8$; polynomial of 4 terms

8. $x(x-6)(x+6)$

9. $x(x+4)^2$

10. $3x(x-8)(x-1)$

11. $\frac{1}{2}x(x-\frac{1}{2})(x+\frac{1}{2})$

12. $x^3 - 18x^2 + 107x - 210$

13. $x^3 + x^2 - 2x$

14. – 3 (multiplicity of 3)

15. 1, 2 (multiplicity of 2)

16. $-\frac{3}{2}$, 1 (multiplicity of 2)

17. 0 (multiplicity of 2), – 1(multiplicity of 2)

PROBLEM SET 6-3

1. $3x^2 - 7x + 2$

2. $9x - 12 - \dfrac{32}{x-1}$

3. $x - 10 + \dfrac{40}{x+3}$

4. $x^2 + 4x + 3$

5. $x^2 - x - 6$

6. $3x^2 + 8x - 3$

7. $x^2 - 3x + 9$

8. $6x - 2 - \dfrac{4}{x-1}$

9. $x^3 - x^2 + 1$

10. $x^3 - 2x^2 - 2x + 4 - \dfrac{35}{x+2}$

11. $P(3) = 0$

12. $P(-2) = 12$

13. $P(3) = 168$

14. $P(-3) = 0$

15. If $P(a) = 0$, then $(x - a)$ is a factor of $P(x)$

16. No **17.** Yes **18.** Yes **19.** No

PROBLEM SET 6-4

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

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

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

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

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

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

7. $3, -3, 1, -1$

8. $2, -2$

9. $4, -4, 2i, -2i$

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

11. $-3, -2, 2$

12. $0, 1, 3$

	Positive Real Roots	**Negative Real Roots**
13.	1	2 or none
14.	1	2 or none
15.	1	3 or 1
16.	1	1
17.	4, 2 or none	1
18.	2 or none	2 or none

PROBLEM SET 6-5

1. $\{\pm 1, \pm 2\}; 1$

2. $\{\pm 1, \pm 2, \pm 4\}; -1$

3. $\{\pm 1, \pm 2, \pm 4, \pm 8, \pm 16\}; -2$

4. $\left\{\pm\frac{1}{12}, \pm\frac{1}{6}, \pm\frac{1}{4}, \pm\frac{1}{2}, \pm\frac{1}{3}, \pm\frac{2}{3}, \pm\frac{3}{4}, \pm\frac{3}{2}, \pm 1, \pm 2, \pm 3, \pm 6\right\}; \frac{1}{2}, \frac{3}{2}, \frac{2}{3}$

5. $5, \pm i\sqrt{7}$

6. $-3, 1, \frac{7}{2}$

7. $\pm\frac{1}{2}, \pm 3$

8. $1, -2, \frac{1\pm\sqrt{7}}{3}$

9. $4+\sqrt{6}, -\sqrt{3}$

10. $1-i, 5i$

11. $2-3i, -6i$

12. $4+i, 2-\sqrt{2}$

13. $x^3 - x^2 + 9x - 9 = 0$

14. $x^3 - 3x^2 - 8x + 30 = 0$

15. $x^4 - 6x^3 + 14x^2 - 24x + 40 = 0$

16. $x^4 - 2x^3 - x^2 + 6x - 6 = 0$

PROBLEM SET 6-6

	Number of Complex Roots	Possible Number of Real Roots	Possible Rational Roots
1.	3	1 or 3	± 1
2.	7	1, 3, 5 or 7	$\pm 1, \pm 3$
3.	10	0, 2, 4, 6, 8 or 10	± 1
4.	4	0, 2, or 4	$\pm 1, \pm 2, \pm 13, \pm 26, \pm \frac{1}{2}, \pm \frac{13}{2}$

5. $-1, \frac{1 \pm i\sqrt{7}}{4}$

6. $4, \frac{1 \pm i\sqrt{3}}{2}$

7. $\pm 2, \pm \sqrt{2}$

8. $0, \frac{3 \pm 3\sqrt{5}}{2}$

9. $4, \pm 3i$

10. $-6, \frac{-1 \pm i}{2}$

11. $\frac{1}{2}, \pm 2i\sqrt{5}$

12. $\frac{2}{5}, \frac{-1 \pm i\sqrt{11}}{6}$