PROBLEM SET 6-3
(Dividing Polynomials)

Divide using long division.

1. $(9x^3 - 18x^2 - x + 2) \div (3x + 1)$

2. $(9x^2 - 21x - 20) \div (x - 1)$

3. $(x^2 - 7x + 10) \div (x + 3)$

4. $(x^3 - 13x - 12) \div (x - 4)$

Divide using synthetic division.

5. $(x^3 - 2x^2 - 5x + 6) \div (x - 1)$

6. $(3x^3 + 17x^2 + 21x - 9) \div (x + 3)$

7. $(x^3 + 27) \div (x + 3)$

8. $(6x^2 - 8x - 2) \div (x - 1)$

9. $(x^4 - 2x^3 + x^2 + x + 1) \div (x - 1)$

10. $(x^4 - 6x^2 - 27) \div (x + 2)$

Use synthetic substitution to find *P(a)*.

11. $P(x) = x^3 - 7x^2 + 15x - 9; a = 3$

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

13. $P(x) = 6x^3 - x^2 + 4x + 3; a = 3$

14. $P(x) = 2x^4 + 6x^3 + 5x^2 - 45; a = -3$

Explain what conclusion you can draw:

15. A polynomial *P(x)* is divided by a binomial $(x - a)$ and the remainder is zero

Use synthetic division to determine whether each binomial is a factor of $x^3 + x^2 - 16x - 16$**.**

16. $(x + 2)$ **17.** $(x - 4)$ **18.** $(x + 1)$ **19.** $(x - 1)$