NAME _____ DATE _____

**Module 11** Simplifying Algebraic Expressions with Polynomials
**Lesson 7** Dividing Polynomials Using Long Division


**Use long division to divide these polynomials. Assume that no divisor is equal to zero.**

**1.** $x - 2\overline{)3x^2 - 7x + 2}$

**2.** $2c + 3\overline{)2c^2 + 7c + 6}$

**3.** $5y + 2\overline{)5y^2 + 7y + 9}$

**4.** $4a - 7\overline{)4a^2 + 5a - 24}$

**5.** $(x^2 + 5x + 4) \div (x + 4)$

**6.** $(a^2 - 9a + 14) \div (a - 2)$

**7.** $(y^2 + 9y - 12) \div (y - 1)$

**8.** $(b^2 + 4b - 9) \div (b + 6)$

**9.** $(-8n + 3n^2 + 4) \div (n - 2)$

**10.** $(21 - 26c + 8c^2) \div (2c - 3)$

**11.** $(6 + m^2 + 6m) \div (m + 5)$

**12.** $(12s^2 + 23s + 13) \div (2 + 3s)$

**13.** $(6d^3 - 11d^2 - 7d + 2) \div (3d + 2)$

**14.** $(4x^3 + 20x^2 + 3x - 55) \div (2x + 5)$

**15.** $(x^2 - 64) \div (x - 8)$

**16.** $(a^2 - 25) \div (5 + a)$

**17.** $(a^3 - 8) \div (a - 2)$

**18.** $(8c^3 + 27) \div (2c + 3)$

**19.** $(y^3 + 125) \div (y - 2)$

**20.** $(18r^4 + 9r^3 + 3r^2) \div (3r^2 + 1)$

## Journal

1. In the equation $(r^2 - 5r + 6) \div (r - 3) = r - 2$, why is it important to know that $r \neq 3$?
2. Why is it important to arrange both the dividend and the divisor in order of decreasing degree of the variable for long division?
3. Explain how to rewrite the dividend in the following problem in order to divide by using long division: $(27a^3 - 8) \div (3a - 2)$. Why would you do this?
4. Explain the process used to check the problem below to make sure the answer is correct.

$$3x + 1 \overline{)12x^2 + 13x + 7} \quad 4x + 3 + \frac{4}{3x + 1}$$

5. Is the answer correct in "Journal Question 4"? Show all work to justify your answer.

## Cumulative Review

1. Simplify: $8^5 \cdot 8^{-3}$.

2. Write $1.98 \times 10^8$ in standard form.

3. Write 0.004 m in scientific notation.

4. Add: $(a^3 - 2a - 1) + (3a + 7)$.

5. Multiply: $3x^4 \cdot -4x^2$

6. Multiply: $4d(3d^2 - 6d)$.

7. Multiply: $(2r + 4)^2$.

8. Multiply: $(3y - 5)(2y^2 + 7y - 4)$.

9. Simplify: $\frac{15x^3yz^6}{-3x^2z^3}$.

10. Simplify: $\frac{-24g^9 - 4g^5 + 32g^3}{8g^2}$.