

**5-4****Practice**

Form K

## Dividing Polynomials

**Divide using long division. Check your answers.**

1.  $(2x^2 + 7x - 5) \div (x + 1)$

To start, divide  $\frac{2x^2}{x} = 2x$

$$\begin{array}{r} 2x \\ x+1 \overline{) 2x^2 + 7x - 5} \\ \underline{2x^2 + 2x} \phantom{- 5} \\ \phantom{2x^2} + 5x - 5 \phantom{- 5} \end{array}$$

Then, multiply  $2x(x + 1) = 2x^2 + 2x$ .

2.  $(x^3 + x^2 - 14x - 27) \div (x + 3)$

3.  $(2x^3 + 13x^2 + 16x + 5) \div (x + 5)$

4.  $(x^2 + 9x + 22) \div (x + 2)$

5.  $(6x^2 + 4x - 16) \div (2x - 2)$

6.  $(8x^3 + 18x^2 + 7x - 3) \div (4x - 1)$

7.  $(12x^2 + 18x - 17) \div (6x - 3)$

**Determine whether each binomial is a factor of  $x^3 - 3x^2 - 4x$ .**

8.  $x - 4$

9.  $x + 2$

10.  $x - 3$

11.  $x + 1$

**Determine whether each binomial is a factor of  $x^3 - 9x^2 + 15x + 25$ .**

12.  $x - 2$

13.  $x + 1$

14.  $x - 5$

15.  $x - 3$

## 5-4

**Practice** (continued)

Form K

## Dividing Polynomials

**Divide using synthetic division.**

16.  $(x^3 - 7x^2 - 36) \div (x - 2)$

To start, write the coefficients of  
the polynomial. Use 2 for the divisor.

$$\begin{array}{r|rrrr} 2 & 1 & -7 & 0 & -36 \\ & & 2 & -10 & -20 \\ \hline & 1 & -5 & -10 & -56 \end{array}$$

17.  $(x^3 + x^2 - 14x - 27) \div (x + 3)$

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

19.  $(x^3 - 15) \div (x - 1)$

20.  $(x^2 + 8) \div (x - 4)$

21.  $(3x^3 - 70x + 2) \div (x - 5)$

22.  $(2x^3 + x^2 - 8x + 4) \div (x + 2)$

**Use synthetic division and the given factor to completely factor each polynomial function.**

23.  $y = 2x^3 + 9x^2 + 13x + 6; (x + 1)$

24.  $y = x^3 + 4x^2 - 7x - 10; (x - 2)$

**Use synthetic division and the Remainder Theorem to find  $P(a)$ .**

25.  $P(x) = 5x^3 - 12x^2 + 2x + 1, a = 3$

26.  $P(x) = 2x^3 - 4x^2 + 3x - 6, a = -2$

27.  $P(x) = x^3 + 6x^2 - 2, a = 3$

28.  $P(x) = 7x^3 + x^2 - 2x + 10, a = 1$

29.  $P(x) = x^3 - 412, a = 8$

30.  $P(x) = 2x^3 + x^2 - 3x - 3, a = -3$