Name_____ Date _____

Extra Practice

In Exercises 1–4, divide using polynomial long division.

1. $\left(x^2 + 6x + 12\right) \div (x - 3)$

2. $\left(x^3 - 4x^2\right) \div \left(x^2 - 16\right)$

3. $\left(4x^3 + 13x^2 + 27x + 6\right) \div (4x + 1)$

4. $\left(x^4 + 2x^3 + 5x^2 + 3x\right) \div \left(x^2 - x\right)$

In Exercises 5–8, divide using synthetic division.

5. $\left(x^2 - 10x + 2\right) \div (x - 2)$

6. $\left(x^3 + 4x^2 + 6x + 4\right) \div (x + 2)$

7. $\left(2x^3 - 54\right) \div (x + 3)$

8. $\left(2x^4 - 11x^3 + 11x^2 + 4x + 4\right) \div (x - 4)$

4.3 Notetaking with Vocabulary (continued)

In Exercises 9–12, match the equivalent expressions. Justify your answers.

9. $\left(x^2 - x - 8\right) \div \left(x - 4\right)$

A. $x + 3 + \dfrac{4}{x - 4}$

10. $\left(x^2 - x + 8\right) \div \left(x - 4\right)$

B. $x + 5 + \dfrac{12}{x - 4}$

11. $\left(x^2 + x - 8\right) \div \left(x - 4\right)$

C. $x + 5 + \dfrac{28}{x - 4}$

12. $\left(x^2 + x + 8\right) \div \left(x - 4\right)$

D. $x + 3 + \dfrac{20}{x - 4}$

In Exercises 13–16, use synthetic division to evaluate the function for the indicated value of x.

13. $f(x) = -3x^3 + 4x^2 - 17x - 6;\ x = 2$

14. $f(x) = -x^4 + x^2 + 4;\ x = -1$

15. $f(x) = x^3 - 10x^2 + 31x - 30;\ x = -5$

16. $f(x) = x^3 + 8x + 27;\ x = 3$

17. What is the value of k such that $\left(-x^4 + 5x^2 + kx - 8\right) \div \left(x - 4\right)$ has a remainder of 0?