Division and the Remainder Theorem *– in book: Section 7.3 p. 453*

Divide using long division.

1. $(x^2 - 5x - 12) \div (x + 3)$

2. $(3x^2 + 4x - 12) \div (x - 5)$

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

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

5. $(2x^3 - 3x^2 + 10x + 3) \div (x - 3)$

6. $(2x^4 + 4x^3 - x^2 + 9) \div (x + 2)$

Use the remainder theorem to find the remainder for each division. Is the divisor a factor of the polynomial?

7. $(10x^3 - x^2 + 8x + 29) \div \left(x + \frac{2}{5}\right)$

8. $(2x^4 + 14x^3 - 2x^2 - 14x) \div (x + 7)$

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

10. $(x^4 - x^3 - 10x^2 + 4x + 24) \div (x + 2)$

11. $(x^4 + 5x^3 - 14x^2) \div (x + 7)$

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

Find the value of k so that each remainder is zero.

13. $(2x^3 + kx^2 + 7x - 3) \div (x - 3)$

14. $(x^3 + 9x^2 + kx - 12) \div (x + 4)$