

2-3 GRADED CLASSWORK

The Remainder and Factor Theorems

Divide using long division.

1. $(2x^4 + 14x^3 - 2x^2 - 14x) \div (x + 7)$

2. $(3t^3 - 10t^2 + t - 5) \div (t - 4)$

Divide using synthetic division.

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

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

5. $(x^4 - 3x^3 - 15x^2 + 19x + 30) \div (x - 5)$

6. $(x^3 - 8x^2 - 29x + 180) \div (x - 10)$

Find each $f(c)$ using synthetic substitution.

7. $f(x) = x^3 + 6x^2 - 9x - 54$; $c = 3$

8. $f(x) = 3x^4 - 6x^2 - 30$; $c = 2$

9. $f(x) = -x^4 + 2x^3 - x^2 + 7x + 5$; $c = -1$

10. $f(x) = x^5 + 6x^3 + 9x - 3$; $c = 4$

Use the Factor Theorem to determine if the binomials given are factors of $f(x)$.

Use the binomials that are factors to write a factored form of $f(x)$.

11. $f(x) = x^3 - 7x - 6$; $(x + 2)$, $(x - 1)$

12. $f(x) = 2x^3 + x^2 - 50x - 25$; $(x + 5)$, $(x - 5)$

13. $f(x) = x^4 - x^3 - 7x^2 + x + 6$; $(x + 2)$, $(x + 4)$

14. $f(x) = 3x^4 - 4x^3 - 61x^2 + 22x + 40$; $(3x + 2)$, $(x - 1)$

15. **ADVERTISING** An advertising manager uses the function $f(x) = 0.0003x^4 - 0.02x^3 - 3x^2 + 522x - 4600$ to predict the profit a commercial will earn a company, based on the number of seconds the commercial lasts, x . Use synthetic substitution to find the profit of a 35-second commercial. Round to the nearest dollar.