

Precalculus – 2.4 Homework
Long Division and Synthetic Division

Divide using long division. Write your remainders in fraction form.

1. $(10x^3 + 18x^2 - 29x + 16) \div (5x - 1)$
2. $(18x^4 + 5x^3 - 11x - 5) \div (2x + 1)$
3. $(2x^3 - 3x^2 - 18x + 29) \div (x^2 - 6)$
4. $(3x^4 - x^3 + 6x^2 + 3x - 14) \div (x^2 + 3)$
5. $(10x^3 + 16x^2 - 24x - 17) \div (x^2 + x - 3)$
6. $(6x^4 + 4x^3 - 25x^2 - 9x - 1) \div (3x^2 + 5x - 3)$
7. $(3x^4 + 2x^3 - 3x^2 + 23x + 14) \div (x^3 - x + 6)$
8. $(8x^4 + 24x^3 + 2) \div (2x^2 + x + 1)$

Use synthetic division to find the quotient and remainder.

9. $(x^3 - x^2 + 2x + 4) \div (x - 2)$
10. $(3x^3 + 2x^2 - x + 3) \div (x - 3)$
11. $(x^5 - 4x^3 + x) \div (x + 3)$
12. $(4x^6 - 3x^4 + x^2 + 5) \div (x - 1)$
13. $(0.1x^3 + 0.2x) \div (x + 1.1)$
14. $(x^5 - 1) \div (x - 1)$

Use synthetic division to determine whether $x - c$ is a factor of the given polynomial.

15. $4x^3 - 3x^2 - 8x + 4$; $x - 2$
16. $-4x^3 + 5x^2 + 8$; $x - 4$
17. $3x^6 + 82x^3 + 27$; $x + 3$
18. $4x^6 - 64x^4 + x^2 - 15$; $x + 4$
19. $2x^4 - x^3 + 2x - 1$; $x - \frac{1}{2}$
20. $3x^4 + x^3 - 3x + 1$; $x + \frac{1}{3}$