In Problems 1-8, divide using long division

1. $(x^2 + 10x + 16) \div (x + 2)$	2. $(x^3 + 2x^2 - 16x + 3) \div (x - 3)$
3. $(14x^3 + 32x^2 + x - 2) \div (7x + 2)$	4. $(7x^2 - 8x + 1) \div (x - 5)$
5. $\dfrac{x^2 + 5x^3 + 8x - 2}{x - 1}$	6. $\dfrac{x^4 - x^3 + 2}{x - 3}$
7. $\dfrac{2x^3 - 4x^2 + x - 5}{x^2 + x - 5}$	8. $\dfrac{9x^5 - x^2 + 2}{x^4 - 1}$

In Problems 9-16, divide using synthetic division

9. $(3x^2 - 10x + 3) \div (x - 3)$	10. $(5x^2 - x - 2) \div (x + 2)$
11. $(x^3 - 7x^2 + x - 2) \div (x + 1)$	12. $(x^4 - x^2 + 3) \div (x - 2)$
13. $(7x + x^2 + 2x^4 - x^3) \div (2 + x)$	14. $\dfrac{x^6 - x^2 + 3x - 3}{x - 1}$
15. $\dfrac{x^4 - 16}{x - 2}$	16. $\dfrac{3x^5 - x^4 + 2x^3 - 4x^2 + x - 2}{x - 2}$

In Problems 17-20, use synthetic division and the Remainder Theorem to find the indicated function value

17. $f(x) = x^3 - 2x^2 + x - 6; \quad f(-2)$	18. $f(x) = 4x^3 - 3x^2 + x + 4; \quad f(3)$
19. $f(x) = x^4 - x^2 - 7; \quad f(1)$	20. $f(x) = 4x^4 - 2x^2 + 6; \quad f(2)$

21. Use synthetic division to divide $f(x) = x^3 - 3x^2 - 10x + 24$ by $x - 4$. Use the result to find all zeros of f.

22. Solve the equation $x^3 + 8x^2 - 3x - 90 = 0$ given that -5 is a zero of $f(x) = x^3 + 8x^2 - 3x - 90$

23. Solve the equation $3x^3 - 13x^2 + 13x - 3 = 0$ given that $\dfrac{1}{3}$ is a root.