1.13 Practice Set

1. How are long division of numbers and long division of polynomials similar? Give an example.

2. When is synthetic division applicable? Give an example of when it would not be applicable.

3. How can you tell whether or not a divisor is a factor of the dividend through division?

Divide each of the following.

4. $\dfrac{15x^2 + 18x}{3x}$

5. $\dfrac{6x^3y^2 + 12x^2y}{2x^2y}$

6. $\dfrac{3a^2b^2 + 6ab^2 - 6b^2}{3a^2b}$

7. $(2y^2 + 5y - 3) \div (2y + 6)$

8. $(4z^3 + 15z^2 + 4z + 32) \div (2z + 8)$

9. $(14t^2 - 12t + 6t^3 + 15) \div (t - 7)$

10. $(3x^5 - 9x^3 + 4x^2 + 12) \div (x^2 - 3)$

11. $\dfrac{x^2 + x + 1}{x - 1}$

12. $\dfrac{4x^2 + 3x - 15}{x - 2}$

13. $\dfrac{2x^3 - 5x^2 + 7}{2x + 1}$

14. $\dfrac{7y^2 - 15}{y + 1}$

15. $(x^6 - 4x^3 - x + 12) \div (x^3 + 5x)$

16. $(2x^3 - 9x + 1) \div (x - 3)$

17. $(4p^2 - 10p + 1) \div (2p + 1)$

18. $(3x^5 y^3 - 18x^3 y^5 + 12x^2 y) \div (-3x^2 y)$

19. $\left(2x^3 + \dfrac{1}{3}x^2 + 2x\right) \div (x - 1)$

20. $(x^3 + x^2 - 2x - 3) \div \left(\dfrac{2}{5}x - 3\right)$

Distributed Practice Problems

Perform the indicated operation and/or simplify completely.

21. $\dfrac{4x^2 - 36}{3x^2 - 18x} \div \dfrac{x^3 + 3x^2}{2x^2 - 12x} \cdot \dfrac{18x^3 + 15x^2}{2x^2 - 6x}$

22. $\dfrac{5}{y - 4y^{-1}}$

23. $\dfrac{7a^{-1} - 5b^{-1}}{49a^{-2} - 25b^{-2}}$

24. $\dfrac{4y}{2y^2 - 3y + 1} + \dfrac{1}{y^2 - 1}$

25. $\dfrac{\dfrac{12}{z+3} + \dfrac{8}{z+5}}{\dfrac{10z + 42}{3z^2 + 24z + 45}}$

26. $(5a^2 b^{-3})^2 (3ab^2)^{-1}$

27. $(5a^2b^{-3})^2 + (3ab^2)^{-1}$

Set up an equation for each of the following and solve.

28. A boat travels 30 miles with the current and 20 miles against the current in the same amount of time. If the speed of the current is 5 mph, find the speed of the boat in still water.

29. It takes Ellis 5 days to do the same job that Tanya can do in 3.5 days. How much time will it take them to do the job if they work together?

30. If it takes a car the same amount of time to travel 210 miles as it does for a plane to travel 750 miles, and if the plane travels 180mph faster than the car, how fast is the plane travelling?