

End of Year Chapter 2 Review

Indicate the answer choice that best completes the statement or answers the question.

1. Which describes the end behavior of

$$f(x) = -3x^3 - 4x^2 + 7x - 3?$$

- a. $\lim_{x \rightarrow -\infty} f(x) = \infty$, $\lim_{x \rightarrow \infty} f(x) = \infty$
 b. $\lim_{x \rightarrow -\infty} f(x) = -\infty$, $\lim_{x \rightarrow \infty} f(x) = -\infty$
 c. $\lim_{x \rightarrow -\infty} f(x) = -\infty$, $\lim_{x \rightarrow \infty} f(x) = \infty$
 d. $\lim_{x \rightarrow -\infty} f(x) = \infty$, $\lim_{x \rightarrow \infty} f(x) = -\infty$

2. What is the greatest possible number of real zeros of

$$f(x) = 2x^3 - x^2 - 29x + 28?$$

- a. 1 b. 2
 c. 3 d. 4

3. What is the greatest possible number of turning points of

$$f(x) = 4x^5 + x^3 - 3x - 1?$$

- a. 3 b. 4
 c. 5 d. 6

4. Find the remainder when $2x^3 + x^2 + 3x + 7$ is divided by $x + 2$. Is the binomial a factor of the polynomial?

- a. 25; yes b. -11; no
 c. 33; no d. -11; yes

5. **FINANCE** For a period of x days, an account balance can be modeled by $f(x) = x^3 - x^2 - 5x + 9$. When was the balance \$12?

- a. Day 3 b. Day 4
 c. Day 7 d. Day 8

6. Divide $(6x^4 - 12x^3 + 9x - 12)$ by $(x - 2)$ using synthetic division.

- a. $6x^3 + 9x^2 + 18x + \frac{6}{x-2}$
 b. $6x^3 + 9x + 18 + \frac{24}{x+2}$
 c. $6x^3 + 9x + 18 + \frac{24}{x-2}$
 d. $6x^3 + 9 + \frac{6}{x-2}$

7. What is the horizontal asymptote of $f(x) = \frac{x^2 - 9}{x^2 - 4}$?

- a. $y = 0$ b. $y = 1$
 c. $y = 2$ d. $y = 3$

8. Solve $\frac{2x-5}{x} + \frac{4x-1}{x+2} = \frac{x+8}{x^2+2x}$.

- a. $\frac{-1 \pm \sqrt{433}}{12}$ b. $-\frac{3}{2}, 2$
 c. $-\frac{2}{9}$ d. $-\frac{2}{3}, \frac{1}{2}$

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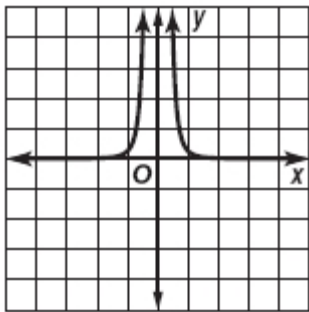
9. Which of the following is the solution to $(3x + 2)(x - 4) > 0$?

- a. $(-\infty, \infty)$ b. $(-4, \frac{2}{3})$
 c. $(-\frac{2}{3}, 4)$ d. $(-\infty, -\frac{2}{3})$ or $(4, \infty)$

10. **ELECTRICITY** The resistance R of a circuit is given by $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$. Find R if $R_1 = 8$ ohms and $R_2 = 12$ ohms.

- a. 0.2 ohm b. 4.8 ohms
 c. 9.6 ohms d. 20 ohms

11. The graph of $f(x) = \frac{1}{3}x^{-4}$ is shown below. Describe the domain of the function.



- a. $(-\infty, \infty)$ b. $(0, \infty)$
 c. $(-\infty, 0)$ or $(0, \infty)$ d. $(-\infty, 0]$ or $[0, \infty)$

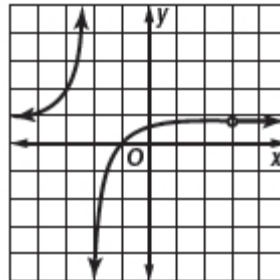
12. What is the solution of $\frac{-3x}{x^2 - 4x - 32} - \frac{2}{x - 8} = \frac{3}{x + 4}$?

- a. -2 b. -1
 c. 1 d. 2

13. Solve $\sqrt[3]{x+2} = \sqrt[6]{9x+10}$.

- a. -1, 6 b. $\frac{-13 \pm \sqrt{193}}{2}$
 c. 1, -6 d. $\frac{13 \pm \sqrt{145}}{2}$

14. Which of the following could be the function represented by the graph?



- a. $f(x) = \frac{x+1}{x+2}$ b. $f(x) = \frac{x+1}{x-2}$
 c. $f(x) = \frac{(x+1)(x-3)}{(x-3)(x+2)}$ d. $f(x) = \frac{(x+1)(x+3)}{(x+3)(x+2)}$

15. Find the polynomial function of least degree with real coefficients in standard form that has the zeros $-1, 3,$ and $\pm 3i$.

- a. $f(x) = x^4 - 2x^3 - 6x - 9$
 b. $f(x) = x^4 + 2x^3 + 6x^2 + 18x - 27$
 c. $f(x) = x^4 - 2x^3 + 6x^2 - 18x - 27$
 d. $f(x) = x^4 - 2x^3 - 12x^2 + 18x - 27$