

1. If $f(x) = \frac{1-3x}{x}$, find its inverse function $f^{-1}(x)$.
- $f^{-1}(x) = \frac{x}{1-3x}$
 - $f^{-1}(x) = 3x$
 - $f^{-1}(x) = 1 - \frac{3}{x}$
 - $f^{-1}(x) = \frac{1-3x}{x}$
 - $f^{-1}(x) = \frac{1}{3+x}$
2. If $g(x) = \sqrt[3]{x-4}$, find its inverse function $g^{-1}(x)$.
- $g^{-1}(x) = x^3 + 4$
 - $g^{-1}(x) = x^{1/3}$
 - $g^{-1}(x) = \sqrt[3]{4+x}$
 - $g^{-1}(x) = \frac{x}{3} + 4$
 - $g^{-1}(x) = (x+4)^3$
3. Which one of the following functions is one-to-one?
- $f(x) = |x-2|$
 - $f(x) = 5x^2$
 - $f(x) = \frac{1}{x} - 2$
 - $f(x) = 3x^4 - 2x^3 + x$
 - $f(x) = (1-x^3)^2$
4. Write the quadratic function $2x^2 - 2x - 1$ in standard form.
- $(x-2)^2 - 1$
 - $2\left(x + \frac{1}{2}\right)^2 - \frac{5}{2}$
 - $(x+2)^2 - 5$
 - $-2\left(x + \frac{1}{2}\right)^2 + \frac{3}{2}$
 - $2\left(x - \frac{1}{2}\right)^2 - \frac{3}{2}$
5. Give the axis of symmetry for the graph of $f(x) = x^2 - 4x$.
- $x = \frac{1}{2}$
 - $x = 2$
 - $x = 1$
 - $y = 2$
 - $y = \frac{1}{2}$
6. Let $f(x) = x^2 - 3x - 4$. For what value of x is $f(x)$ minimal?
- $x = 3$
 - $x = 4$
 - $x = \frac{3}{2}$
 - $x = \frac{1}{2}$
 - $x = -\frac{1}{2}$
7. Let $f(x) = (x-3)(1-x)$. Give the direction in which the graph of $f(x)$ opens and the coordinates of its vertex.
- Opens up, $(2, -3)$
 - Opens down, $(2, 1)$
 - Opens up, $(2, 1)$
 - Opens down, $(2, -3)$
 - Opens down, $(2, -1)$
8. Give the x -intercept(s) of the graph of $f(x) = -2x^2 - 4x + 5$.
- $x = 5$
 - $x = -1, x = 4$
 - $x = 1, x = -4$
 - $x = -1 + \frac{\sqrt{14}}{2}, x = -1 - \frac{\sqrt{14}}{2}$
 - $x = 1 + \frac{\sqrt{14}}{2}, x = 1 - \frac{\sqrt{14}}{2}$

9. A model rocket is launched from the ground with an initial velocity of 49 m/s and an initial height of 0 meters. The height of the rocket in meters is given by the function $h(x) = -4.9t^2 + v_0t + h_0$, where v_0 is the initial velocity and h_0 is the initial height. How long will it take for the rocket to fall back to the ground?

- a) 5 seconds
- b) 10 seconds
- c) 20 seconds
- d) 49 seconds
- e) 100 seconds

10. Pat wishes to fence in a rectangular area, using the wall of her garage as one side, so only three sides of fencing need to be used. If she has 80 feet of fencing total, what is the maximum area that can be fenced in?

- a) 20 square feet
- b) 40 square feet
- c) 400 square feet
- d) 800 square feet
- e) 1200 square feet

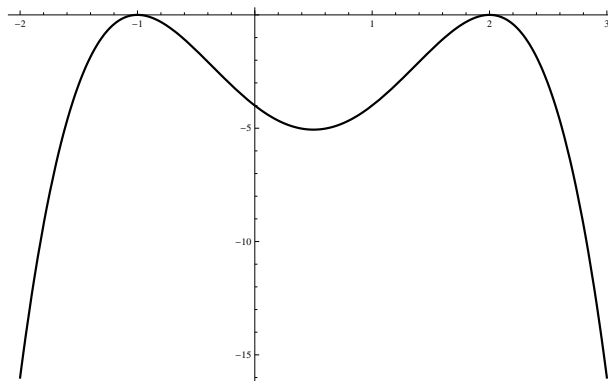
11. Let $f(x) = (x^2 - 6)^2(x^2 - 1)$. Which zeroes of $f(x)$ occur an even number of times?

- a) All of the zeroes occur an even number of times.
- b) None of the zeroes occur an even number of times.
- c) $x = -1, 1$
- d) $x = \sqrt{6}, -\sqrt{6}$
- e) $x = -\sqrt{6}, 1$

12. Which one of the following functions has a graph with opposite end behavior and which points up on the left?

- a) $f(x) = x^2 - x - 2$
- b) $f(x) = (x + 2)^3$
- c) $f(x) = x^3 - x - 4$
- d) $f(x) = -x^5 - x - 4$
- e) $f(x) = -x^2 - x - 2$

13. Which function has the graph below?



- a) $f(x) = (x + 1)^2(x - 2)^2$
- b) $f(x) = (x + 1)(x - 2)$
- c) $f(x) = -(x + 1)(x - 2)$
- d) $f(x) = -x(x + 1)^2(x - 2)$
- e) $f(x) = -(x + 1)^2(x - 2)^2$

14. Use synthetic division to divide $\frac{x^4 + 3x^3 - 4x^2 + 2x + 9}{x - 2}$.

- a) $x^3 + 5x^2 + 6x + 14 + \frac{37}{x - 2}$
- b) $x^3 + x^2 - 6x + 14 - \frac{19}{x - 2}$
- c) $x^3 - 3x^2 - 10x + 11 + \frac{28}{x - 2}$
- d) $x^3 + 3x^2 - 2x + 4 + \frac{1}{x - 2}$
- e) $x^3 - 5x^2 + 12x + 4 - \frac{18}{x - 2}$

15. Use synthetic division to divide $\frac{x^3 - 10}{x + 2}$.

- a) $x^2 - 12x$
- b) $x^2 - 2x + 4 - \frac{18}{x + 2}$
- c) $x^2 + 2x + 4 - \frac{2}{x + 2}$
- d) $x^2 - \frac{12}{x + 2}$
- e) $x^2 - 8x + 12 - \frac{2}{x + 2}$

16. The function $f(x) = x^3 + 6x^2 + 11x + 6$ has a zero at $x = -1$. Find the other two zeroes of the function.

- a) $x = -3, x = -2$
- b) $x = -2, x = -1$
- c) $x = -1, x = 2$
- d) $x = 1, x = 3$
- e) $x = 3, x = 3$

17. Give the vertical asymptote(s) of the graph of $f(x) = \frac{2x}{x^2 - 5x + 6}$.

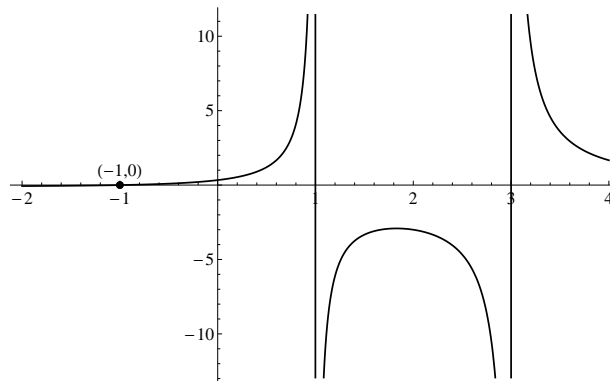
- a) $x = -2, x = -3$
- b) $x = 1, x = 6$
- c) $x = 2, x = 3$
- d) $x = 0, x = 6$
- e) There are no vertical asymptotes.

18. Give the horizontal asymptote(s) of the graph of $f(x) = \frac{(x+1)(x-3)}{x^3 - 9}$.

- a) $y = 0$
- b) $y = 3$
- c) $y = -3$
- d) $y = 0, y = 3, y = -3$
- e) $y = 3, y = -3$

19. Give the vertical asymptote(s) of the graph of $f(x) = \frac{x^2 - 4}{x^2 - 3x + 2}$.

- a) $x = -1, x = 2$
- b) $x = 1, x = 2$
- c) $x = 2$
- d) $x = -1$
- e) $x = 1$



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

EXAM II- SAMPLE D

- 1. E
- 2. A
- 3. C
- 4. E
- 5. B
- 6. C
- 7. B
- 8. D
- 9. B
- 10. D
- 11. D
- 12. D
- 13. E
- 14. A
- 15. B
- 16. A
- 17. C
- 18. A
- 19. E
- 20. E