

CH-2&4 Assignment

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. The graph of which function below has 1 vertical asymptote and 1 hole?

A $y = \frac{x-25}{x^2+5}$

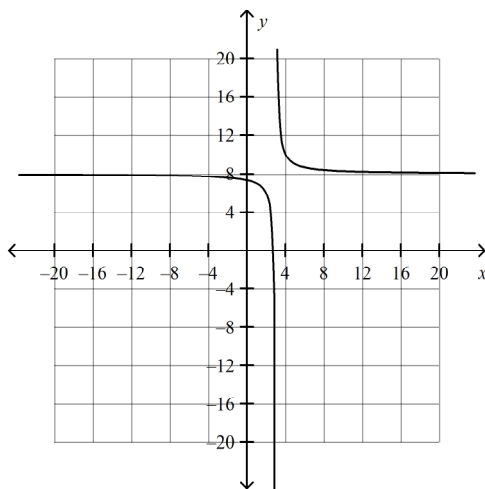
C $y = \frac{x^2}{x+4}$

B $y = \frac{x+3}{x^2+4}$

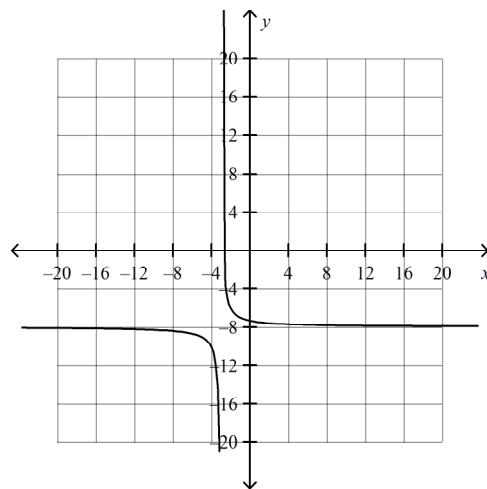
D $y = \frac{x+5}{x^2+2x-15}$

2. Which graph represents the function $f(x) = \frac{-2}{x+3} - 8$?

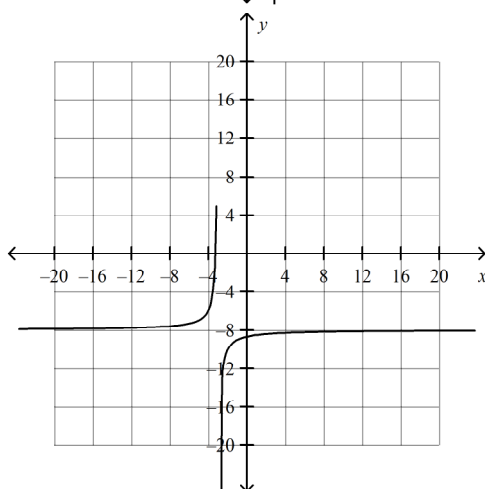
A



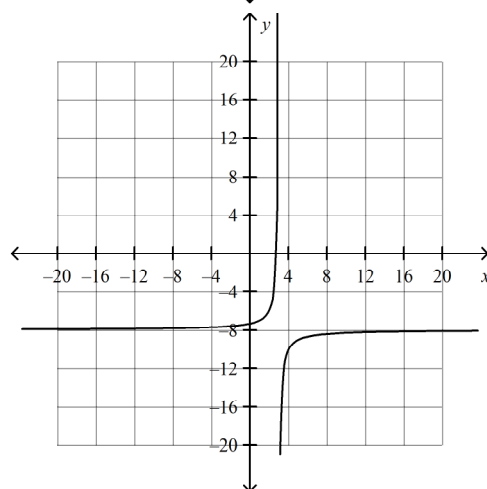
C



B



D



3. What is the equation of the vertical asymptote of the graph of this function?

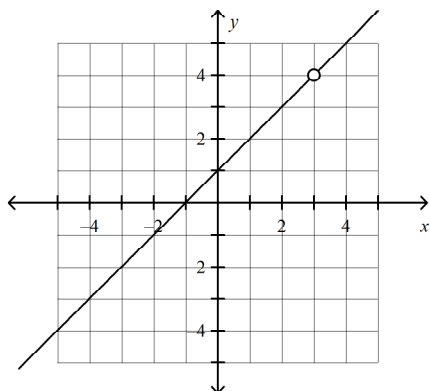
$$y = \frac{x-4}{x^2+4}$$

- A** $x = 4$
B $x = 0$

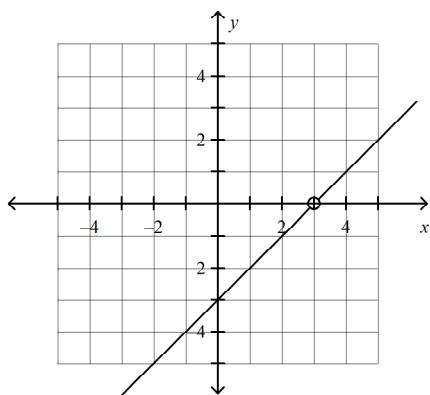
- C** $x = -4$
D The graph has no vertical asymptote.

4. Which graph represents the function $y = \frac{(x-3)(-x-1)}{x-3}$?

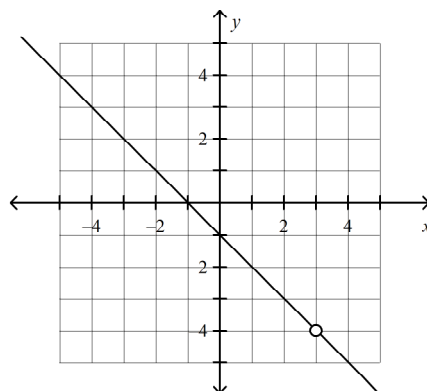
A



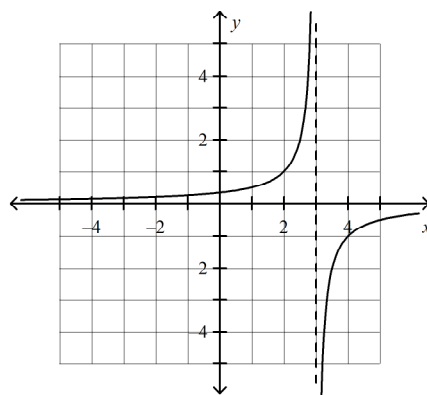
B



C



D



5. If $f(x) = -3\sqrt{x} - 4$ and $g(x) = \sqrt{x} + 5$, what is the simplified combined function $h(x) = \frac{f(x)}{g(x)}$?

A $h(x) = \frac{-3x + 11\sqrt{x} - 20}{x - 25}, x \geq 0, x \neq 25$

C $h(x) = \frac{-3x + 11\sqrt{x} - 20}{x + 25}, x \geq 0$

B $h(x) = \frac{-3x + 11\sqrt{x} + 20}{x - 25}, x \geq 0, x \neq 25$

D $h(x) = \frac{-3x + 11\sqrt{x} + 20}{x + 25}, x \geq 0$

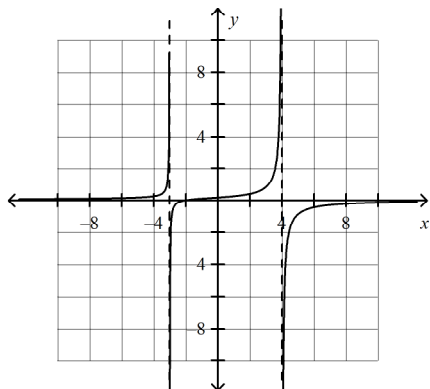
6. For the graph of this rational function, identify the equations of any asymptotes and the coordinates of any hole.

$$y = \frac{x-5}{x^2-x-6}$$

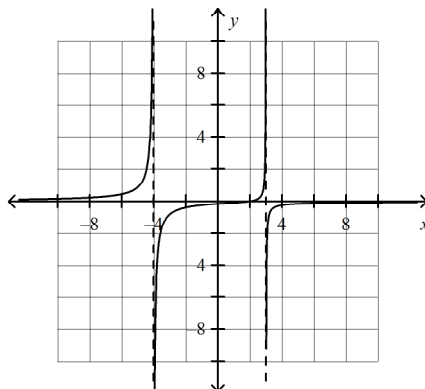
- A** The graph has a vertical asymptote at $x = 0$, and a horizontal asymptote at $y = -2$.
B The graph has a vertical asymptote at $x = 0$, a hole at $(3, -2)$, and a horizontal asymptote at $y = -2$.
C The graph has vertical asymptotes at $x = -2$ and $x = 3$, and a horizontal asymptote at $y = 0$.
D The graph has a vertical asymptote at $x = -2$, a hole at $(3, -2)$, and a horizontal asymptote at $y = 0$.

7. Which graph represents the function $y = \frac{x-2}{x^2+x-12}$?

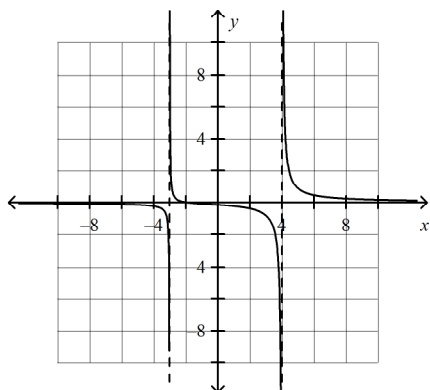
A



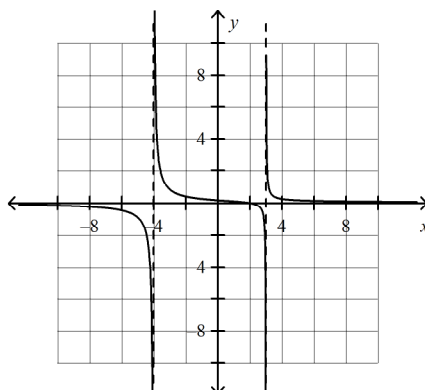
C



B



D



8. For the functions $f(x) = x + 3$ and $g(x) = x^2 - 5$, which expression has the greatest value?

- A $g(f(-5))$ B $g(f(-1))$ C $f(g(4))$ D $f(g(-2))$

9. Given $f(x) = x - 2$ and $g(x) = 3x^2 + 4$, what is an explicit equation for $p(x) = f(x) \cdot g(x)$?

- A $p(x) = 3x^3 - 6x^2 + 4x - 8$ C $p(x) = 3x^2 + x + 2$
B $p(x) = 4x^3 + 6x^2 + 4x - 8$ D $p(x) = 3x^2 - 2x - 8$

10. Given $f(x) = \sqrt{4-x}$ and $g(x) = 5 - 4x$, what is an explicit equation for $f(g(x))$?

- A $f(g(x)) = 5 - \sqrt{4-4x}$ C $f(g(x)) = -1 - \sqrt{4-4x}$
B $f(g(x)) = \sqrt{-1-4x}$ D $f(g(x)) = \sqrt{4x-1}$

Short Answer (Write the Final Answer on the Response Form)

11. Solve the equation $\frac{4}{x-6} = \frac{5}{x}$.

12. What is the solution of this radical equation, to the nearest tenth if necessary?

$$\frac{x+1}{x-9} - 9 = x + 8$$

13. Given $f(x) = 9x^2 + 6x$ and $g(x) = 6 - x$, determine $5g(x) - f(x)$.

14. Given the functions $f(x) = x^3 - 64x$ and $g(x) = x - 8$, determine the simplified equation for the combined function

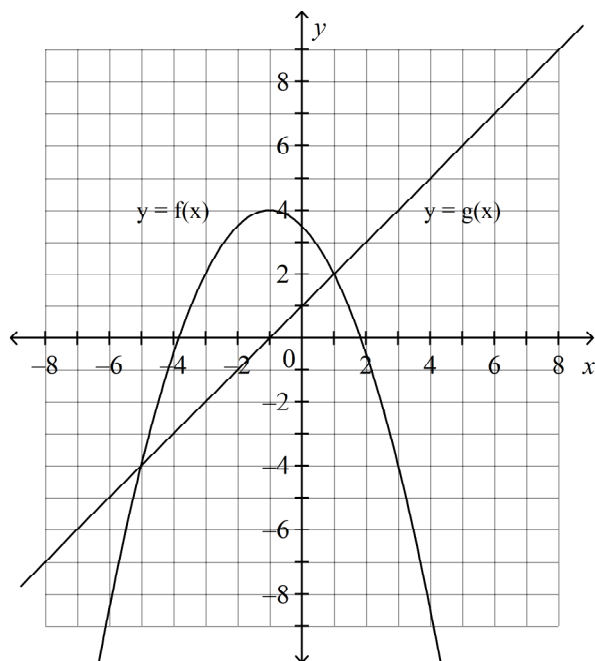
$$h(x) = \frac{f(x)}{g(x)}.$$

15. Given the function $f(x) = x^2 - 9$, determine the value of $f(f(4))$.

16. Given $f(x) = x^2 - 2$, $g(x) = 3x + 2$, and $h(x) = 3 - x^3$, write an explicit equation for $k(x) = f(x) \cdot g(x) - h(x)$.

17. Given the functions $f(x) = 2x + 6$ and $g(x) = \sqrt{x + 3}$, determine an explicit equation for $f(g(x))$.

18. Given the graphs of $y = f(x)$ and $y = g(x)$, determine $g(f(-3))$.



19. Given the functions $f(x) = x^2 - x + 3$ and $g(x) = \frac{2x-3}{x-1}$, determine $g(f(-2))$.

20. Given $f(x) = \frac{x-2}{4}$ and $g(x) = 2x^2 + 4$, determine an explicit equation for $f(g(x))$.

Open-Ended Responses (Show all work on the Response Form)

21. Given the functions $f(x) = x^2 + 3x + 2$ and $g(x) = x + 1$, determine a simplified equation for composite function $f(g(x))$. Show your work.
22. Two cars travel to Edmonton at the same time. Car A travels 230 km in the same time it takes Car B to travel 180 km. Car A travels an average of 25 km/h faster than Car B. A rational equation that relates the average speeds of the two cars is: $\frac{230}{v+25} = \frac{180}{v}$, where v kilometres per hour is the average speed of Car B. Determine the average speed of each car, to the nearest kilometre per hour.
23. What is the solution to the rational equation $\frac{x-2}{x+4} + \frac{x+1}{x+6} = \frac{11x+32}{x^2+10x+24}$?