Limits - Readiness Assurance Test

1. Suppose that $q = f(p)$, so that the quantity q is a function of the quantity p. Let's say the dependent variable has value 10 when the independent variable has value 2. Which equation best expresses this relationship?

   (a) 2 = f(10)
   (b) 10 = f(2)
   (c) ...
   (d) ...

2. Simplify the following expression:

$$\frac{x^2 - 6x + 8}{x^2 - 5x + 6}$$

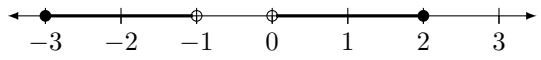
   (a) $\dfrac{(x-4)}{(x-3)}$
   (b) b
   (c) c
   (d) d
   (e) e

3. Find all vertical asymptote(s), horizontal asymptote(s), and hole(s) for the function given below.

$$f(x) = \frac{x^2 - 6x + 8}{x^2 - 5x + 6}$$

   (a) vertical asymptote of $x = 3$, horizontal asymptote of $y = 1$, hole when $x = 2$
   (b) vertical asymptote of $x = 2$, horizontal asymptote of $y = 1$, hole when $x = 3$
   (c) vertical asymptote of $x = 2$, horizontal asymptote of $y = 1$, hole when $x = 3$
   (d) some more mix up

4. Use interval notation to represent the number line shown below.



   (a) $[-3, 2]$
   (b) $[-3, -1) \cup (0, 2]$
   (c) $(-3, -1) \cup (0, 2)$
   (d) $(-3, -1] \cup [0, 2)$
   (e) $[-3, -1] \cup [0, 2]$

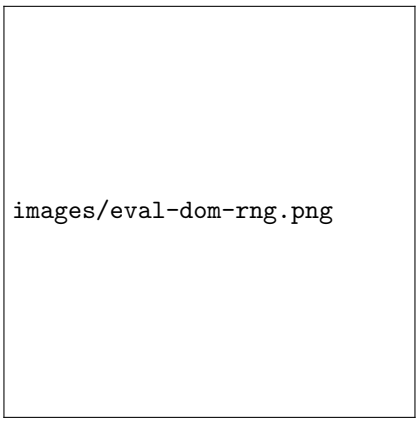
5.

6. Which expression is equal to the product $(x - 4)(x^2 + 3x - 3)$?

   (a) $x^3 - x^2 - 15x + 12$
   (b) $x^2 + 4x - 7$
   (c) need a bit of time to find good distractors

7.

8. Consider the function $h(x)$ whose graph is pictured below. Select the most accurate statement.



   (a) $h(1) = 3$
   (b) $h(2) = 3$
   (c) $h(3) = 2$
   (d) $h(4) = 1$

9.

10. (10) What is the domain of the function

$$\frac{x-1}{x+1} + \frac{x+3}{x-4}?$$

   (a) All real numbers
   (b) All real numbers except 1 and -4
   (c) All real numbers except 1 and -3
   (d) All real numbers except -1 and 4
   (e) All real numbers except -1 and 3