1. A drippy faucet adds one milliliter to the volume of water in a tub at precisely one-second intervals. Let \( f \) be the function that represents the volume of water in the tub at time \( t \). Which of the following statements is correct?

(a) \( f \) is a continuous function at every time \( t \)
(b) \( f \) is continuous for all \( t \) other than the precise instants when the water drips into the tub.
(c) \( f \) is not continuous at any time \( t \).
(d) There is not enough information to know where \( f \) is continuous.

2. A drippy faucet adds one milliliter to the volume of water in a tub at precisely one second intervals. Let \( g \) be the function that represents the volume of water in the tub as a function of the depth of the water, \( x \), in the tub. Which of the following statements is correct?

(a) \( g \) is a continuous function at every depth \( x \).
(b) there are some values of \( x \) at which \( g \) is not continuous.
(c) \( g \) is not continuous at any depth, \( x \).
(d) not enough information is given to know where \( g \) is continuous.

3. You know the following statement is true:

\[ \text{If } f(x) \text{ is a polynomial, then } f(x) \text{ is continuous.} \]

Which of the following is also true?

(a) If \( f(x) \) is not continuous, then it is not a polynomial.
(b) If \( f(x) \) is continuous, then it is a polynomial.
(c) If \( f(x) \) is not a polynomial, then it is not continuous.

4. **True or False**: You were once exactly 3 feet tall.

(a) True, and I am very confident
(b) True, but I am not very confident
5. **True or False:** At some time since you were born your weight in pounds equaled your height in inches.

(a) True, and I am very confident
(b) True, but I am not very confident
(c) False, but I am not very confident
(d) False, and I am very confident

6. **True or False:** Along the Equator, there are two diametrically opposite sites that have exactly the same temperature at the same time.

(a) True, and I am very confident
(b) True, but I am not very confident
(c) False, but I am not very confident
(d) False, and I am very confident

7. Suppose that during half-time at a basketball game the score of the home team was 36 points. **True or False:** There had to be at least one moment in the first half when the home team had exactly 25 points.

(a) True, and I am very confident
(b) True, but I am not very confident
(c) False, but I am not very confident
(d) False, and I am very confident

8. At what point on the interval \([-7, 2]\) does the function \(f(x) = \frac{3e^x}{4e^x - 4}\) have a discontinuity?

(a) \(x = 0\)
(b) \(x = 1\)
(c) \(x = 3\)
(d) \(x = 4\)
(e) There is no discontinuity on this interval.
9. For what value of the constant $c$ is the function $f(x)$ continuous, if

$$f(x) = \begin{cases} 
  cx + 9 & \text{if } x \in (-\infty, 5] \\
  cx^2 - 9 & \text{if } x \in (5, \infty) 
\end{cases}$$

(a) $c = -\frac{9}{5}$
(b) $c = \frac{9}{10}$
(c) $c = \frac{9}{25}$
(d) This is not possible.