

Who Am I?

Guess my number from the following clues.

Note to teachers:

I would display one clue at a time and allow students to make a guess after each problem.

Or you could have the students write down all the possibilities after each clue.

1. I am a whole number with $\left(\frac{d}{dx}(x^2 + 3x + 5) \Big|_{x=0} \right)$ digits.

2. My tens digit is $\left(\frac{d}{dx} \left(\frac{-80}{\sqrt{x}} \right) \Big|_{x=4} \right)$.

3. I am divisible by $\left(\frac{d}{dt} \left(\frac{(t^2 - 3)^4}{4} \right) \Big|_{t=2} \right)$.

4. I am divisible by $\left(\frac{d}{dx} \left(\frac{-3 - 7x - 6x^2}{2x + 3} \right) \Big|_{x=-1} \right)$.

5. I am less than $\left(\frac{d}{dx} (400 \sin(2x)) \Big|_{x=0} \right)$.

6. I am divisible by $\left(\frac{d}{dx} \left(\frac{28}{1-x} \right) \Big|_{x=-1} \right)$.

7. My ones digit is $\left(\frac{d}{dx} (x^3) \Big|_{x=\sqrt{2}} \right)$.

8. My hundreds digit is greater than my ones digit.

9. Each of my digits is different.

10. My ones digit is greater than my tens digit.

Who am I?

Here are the answers to the seven derivative problems:

(1) 3

(2) 5

(3) 4

(4) 9

(5) 800

(6) 7

(7) 6

Answer: I am 756.