

Quiz 3

Name:

Evaluate each of the limits

$$1. \lim_{x \rightarrow 5} \frac{x^2 - 25}{x - 5} = \lim_{x \rightarrow 5} \frac{(x-5)(x+5)}{(x-5)} = \lim_{x \rightarrow 5} (x+5) = 10$$

$$2. \lim_{x \rightarrow 5} \frac{x^2 - 16}{x - 4} = \frac{25 - 16}{5 - 4} = 9$$

$$3. \lim_{x \rightarrow 2} \frac{x^3 - 4x}{x - 2} = \lim_{x \rightarrow 2} \frac{x(x^2 - 4)}{x - 2} = \lim_{x \rightarrow 2} \frac{x(x-2)(x+2)}{x-2} = \lim_{x \rightarrow 2} x(x+2) \\ = 2(2+2) = 12$$

$$4. \lim_{x \rightarrow 0} \frac{3^{2x} - 1}{3^x - 1} = \lim_{x \rightarrow 0} \frac{(3^x - 1)(3^x + 1)}{3^x - 1} = \lim_{x \rightarrow 0} (3^x + 1) = 3^0 + 1 = 1 + 1 = 2$$

Note $3^{2x} = (3^x)^2$ so $3^{2x} - 1 = (3^x)^2 - 1 = (3^x - 1)(3^x + 1)$