

2.56
c1

$$\left[3 \left(1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots \right) \right]^{\log_5 x} = \left[20 \left(1 - \frac{1}{4} + \frac{1}{16} - \dots \right) \right]^{\log_5 x}$$

$\frac{20 \cdot 20 \cdot 20 \dots}{1 \neq x > 0}$

$$\left(3 \cdot \frac{1}{1 + \frac{1}{2}} \right)^{\log_5 x} = \left[20 \left(\frac{1}{1 + \frac{1}{4}} \right) \right]^{\log_5 x}$$

$$2^{\log_5 x} = 16^{\log_5 x}$$

$$2^{\log_5 x} = 2^{4 \log_5 x}$$

$$\log_5 x = 4 \log_5 x$$

$$\log_5 x = \frac{4}{\log_5 x}$$

$$\log_5^2 x = 4$$

$$\log_5 x = 2$$

$$\boxed{x = 25}$$

$$\log_5 x = -2$$

$$\boxed{x = \frac{1}{25}}$$