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$$x = s \cdot m \cdot 2^c$$

$$m \in [\frac{1}{2}, 1)$$

$$rd(x) = s \cdot m_t^r \cdot 2^c$$

$$m_t^r \in [\frac{1}{2}, 1)$$

$$|m - m_t^r| \leq \frac{1}{2} \cdot 2^{-t}$$

$$\frac{|rd(x) - x|}{|x|} \leq 2^{-t}$$

$$\frac{|s \cdot m_t^r \cdot 2^c - s \cdot m \cdot 2^c|}{|s \cdot m \cdot 2^c|} \quad \text{cancel } s \cdot 2^c =$$

$$= \frac{|m_t^r - m|}{m}$$

$$m \in [\frac{1}{2}, 1)$$

$$\frac{1}{m} \in (1, 2] \quad |m - m_t^r| \leq \frac{1}{2} \cdot 2^{-t}$$

$$\frac{|m_t^r - m|}{m} \leq \frac{1}{2} \cdot 2^{-t} \cdot 2 = 2^{-t}$$