$$\sqrt{444448889} = ?$$

$$= \sqrt{44444\,00000 + 88880 + 9}$$

$$= \sqrt{44444 \cdot 10^5 + 8888 \cdot 10^1 + 9}$$

$$= \sqrt{4(11111) \cdot 10^5 + 8(1111) \cdot 10^1 + 9}$$

$$= \sqrt{4 \cdot \frac{99999}{9} \cdot 10^5 + 8 \cdot \frac{9999}{9} \cdot 10^1 + 9}$$

$$= \sqrt{4 \cdot \frac{10^5 - 1}{9} \cdot 10^5 + 8 \cdot \frac{10^4 - 1}{9} \cdot 10^1 + 9}$$

$$= \sqrt{\frac{4(10^5 - 1) \cdot 10^5 + 8(10^4 - 1) \cdot 10^1 + 81}{9}}$$

$$= \sqrt{\frac{4(10^{10} - 10^5) + 8(10^5 - 10) + 81}{9}}$$

$$= \sqrt{\frac{4 \cdot 10^{10} - 4 \cdot 10^5 + 8 \cdot 10^5 - 80 + 81}{9}}$$

$$= \sqrt{\frac{4 \cdot 10^{10} + 4 \cdot 10^5 + 1}{9}}$$

$$= \sqrt{\frac{2^2 \cdot (10^5)^2 + 2 \cdot 2 \cdot 10^5 + 1}{3^2}} = \sqrt{\frac{(2 \cdot 10^5)^2 + 2 \cdot (2 \cdot 10^5)(1) + 1^2}{3^2}}$$

$$= \sqrt{\frac{(2 \cdot 10^5 + 1)^2}{3^2}} = \frac{2 \cdot 10^5 + 1}{3} = \frac{200001}{3}$$

$$= 66667$$