SQUARE ROOTS

A DEFINITION

A.1 CALCULATING SQUARE ROOTS OF PERFECT SQUARES

Ex 1: Calculate:

$$\sqrt{4} = \boxed{2}$$

Answer: Since $2 \times 2 = 4$, we have $\sqrt{4} = 2$.

Ex 2: Without using a calculator, calculate:

$$\sqrt{36} = \boxed{6}$$

Answer: Since $6 \times 6 = 36$, we have $\sqrt{36} = 6$.

Ex 3: Calculate:

$$\sqrt{64} = \boxed{8}$$

Answer: Since $8 \times 8 = 64$, we have $\sqrt{64} = 8$.

Ex 4: Calculate:

$$\sqrt{49} = \boxed{7}$$

Answer: Since $7 \times 7 = 49$, we have $\sqrt{49} = 7$.

Ex 5: Calculate:

$$\sqrt{100} = \boxed{10}$$

Answer: Since $10 \times 10 = 100$, we have $\sqrt{100} = 10$.

Ex 6: Calculate:

$$\sqrt{81} = \boxed{9}$$

Answer: Since $9 \times 9 = 81$, we have $\sqrt{81} = 9$.

Ex 7: Calculate:

$$\sqrt{0} = \boxed{0}$$

Answer: Since $0 \times 0 = 0$, we have $\sqrt{0} = 0$.

A.2 CALCULATING SQUARE ROOTS OF FRACTIONS

Ex 8: Write in fraction form:

$$\sqrt{\frac{1}{4}} = \boxed{\frac{1}{2}}$$

Answer: Since $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$, we have $\sqrt{\frac{1}{4}} = \frac{1}{2}$.

Ex 9: Write in fraction form:

$$\sqrt{\frac{1}{25}} = \boxed{\frac{1}{5}}$$

Answer: Since $\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$, we have $\sqrt{\frac{1}{25}} = \frac{1}{5}$.

Ex 10: Write in fraction form:

$$\sqrt{\frac{1}{9}} = \boxed{\frac{1}{3}}$$

Answer: Since $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$, we have $\sqrt{\frac{1}{9}} = \frac{1}{3}$.

Ex 11: Write in fraction form:

$$\sqrt{\frac{1}{16}} = \boxed{\frac{1}{4}}$$

Answer: Since $\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$, we have $\sqrt{\frac{1}{16}} = \frac{1}{4}$.

Ex 12: Write in fraction form:

$$\sqrt{\frac{9}{16}} = \boxed{\frac{3}{4}}$$

Answer: Since $\frac{3}{4} \times \frac{3}{4} = \frac{9}{16}$, we have $\sqrt{\frac{9}{16}} = \frac{3}{4}$.

Ex 13: Write in fraction form:

$$\sqrt{\frac{4}{9}} = \boxed{\frac{2}{3}}$$

Answer: Since $\frac{2}{3} \times \frac{2}{3} = \frac{4}{9}$, we have $\sqrt{\frac{4}{9}} = \frac{2}{3}$.

B CALCULATING SQUARE ROOTS

B.1 USING A CALCULATOR

Ex 14: Using a calculator, evaluate $\sqrt{2}$ (round to 2 decimal places).

$$\sqrt{2} \approx \boxed{1.41}$$

Answer: By entering $\sqrt{2}$ and pressing the equal button, the calculator displays: $1.41421356237\ldots$
So $\sqrt{2} \approx 1.41$ (rounded to two decimal places).

Ex 15: Using a calculator, evaluate $\sqrt{10}$ (round to 2 decimal places).

$$\sqrt{10} \approx \boxed{3.16}$$

Answer: By entering $\sqrt{10}$ and pressing the equal button, the calculator displays: $3.16227766017\ldots$
So $\sqrt{10} \approx 3.16$ (rounded to two decimal places).

Ex 16: Using a calculator, evaluate $\sqrt{50}$ (round to 2 decimal places).

$$\sqrt{50} \approx \boxed{7.07}$$

Answer: By entering $\sqrt{50}$ and pressing the equal button, the calculator displays: $7.07106781187\ldots$
So $\sqrt{50} \approx 7.07$ (rounded to two decimal places).

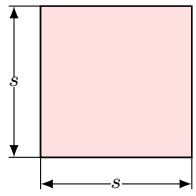
Ex 17: Using a calculator, evaluate $\sqrt{0.5}$ (round to 2 decimal places).

$$\sqrt{0.5} \approx \boxed{0.71}$$

Answer: By entering $\sqrt{0.5}$ and pressing the equal button, the calculator displays: $0.70710678118\ldots$
So $\sqrt{0.5} \approx 0.71$ (rounded to two decimal places).

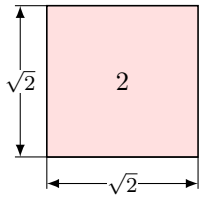
B.2 FINDING THE SIDE LENGTH OF A SQUARE

Ex 18: The area of a square is 2 m^2. What is the length of the side of the square, s?



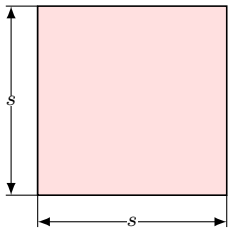
$s \approx \boxed{1.41}$ m (round your answer to 2 decimal places)

Answer: The area of a square is s^2, so $s^2 = 2$.
Therefore, $s = \sqrt{2} \approx 1.41$ m.



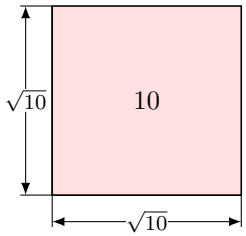
$\sqrt{2} \times \sqrt{2} = 2$

Ex 19: The area of a square is 10 m^2. What is the length of the side of the square, s?



$s \approx \boxed{3.16}$ m (round your answer to 2 decimal places)

Answer: The area of a square is s^2, so $s^2 = 10$.
Therefore, $s = \sqrt{10} \approx 3.16$ m (rounded to two decimal places).



$\sqrt{10} \times \sqrt{10} = 10$