

$$Z(f)$$

$$\{x \in \mathbb{R} \mid f(x) = 0\}$$

Set of zeroes of a polynomial function

$$f(x) = 0$$

Find $z(k)$ of each of the polynomial functions defined by the following rules in \mathbb{R} :

1 $k(x) = 2x - 6$

2 $k(x) = x^2 - 3x - 10$

3 $k(x) = 8$

4 $k(x) = 0 = 0$

1) $2x - 6 = 0 \rightarrow 2x = 6 \rightarrow x = 3$

$z(k) = \{3\}$

2) $x^2 - 3x - 10 = 0$

$(x - 5)(x + 2) = 0$

$x = 5, x = -2$

$\rightarrow z(k) = \{5, -2\}$

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Find in \mathbb{R} the set of zeroes of each of the polynomial functions defined by the following rules :

1 $f(x) = x^2 - 81$

2 $k(x) = x^2 + 49$

$$x^2 - 81 = 0$$

$$(x - 9)(x + 9) = 0$$

$$x = 9, x = -9$$

$$Z(f) = \{9, -9\}$$

$$x^2 + 49 = 0$$

$$x^2 = -49$$

$$\notin \mathbb{R}$$

$$Z(k) = \emptyset$$

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$$3 \quad g(x) = x^2 - 10x + 25$$

$$4 \quad f(x) = x^3 + 7x^2 - 18x$$

$$x^2 - 10x + 25 = 0$$

$$(x - 5)(x - 5) = 0$$

$$x = 5 \quad \mathcal{Z}(g) = \{5\}$$

$$\underbrace{\text{stick}} \times \underbrace{\text{stick}} \times \underbrace{\text{rod}} = 0$$

$$x^3 + 7x^2 - 18x = 0$$

$$x(x^2 + 7x - 18) = 0$$

$$x(x - 2)(x + 9) = 0$$

$$\begin{array}{l} x = 0 \\ x = 2 \\ x = 9 \end{array}$$

$$\mathcal{Z}(f) = \{0, 2, 9\}$$

Find in \mathbb{R} the set of zeroes of each of the polynomial functions defined by the following rules :

1 $f(x) = x^2 - 2x - 1$

2 $g(x) = x^2 - 3x + 7$

$$x^2 - 2x - 1 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{2 \pm \sqrt{4 + 4}}{2}$$

$$\frac{2 + 2\sqrt{2}}{2}, \frac{2 - 2\sqrt{2}}{2}$$

$$Z_f \rightarrow Z(f) = \{1 + \sqrt{2}, 1 - \sqrt{2}\}$$

~~$a = 1$~~
 ~~$b = -2$~~
 ~~$c = -1$~~

Choose the correct answer from the given ones :

1 The set of zeroes of the function $f : f(x) = 2x$ is (Suez 22)

- (a) $\mathbb{R} - \{0\}$ (b) $\{2\}$ (c) $\{0\}$ (d) $\mathbb{R} - \{2\}$

2 The set of zeroes of the function $f : f(x) = x^2 + 25$ is (El-Fayoum 23)

- (a) $\{5\}$ (b) $\{5, -5\}$ (c) \mathbb{R} (d) \emptyset

3 The set of zeroes of the function $f : f(x) = x^2 - 16$ is (Alex. 22)

- (a) $\{-4\}$ (b) $\{4\}$ (c) $\{4, -4\}$ (d) \emptyset

4 The set of zeroes of the function $f : f(x) = x^2 - 5x + 6$ is (El-Monofia 22)

- (a) $\{2, 3\}$ (b) $\{5, 6\}$ (c) $\mathbb{R} - \{5, 6\}$ (d) $\mathbb{R} - \{2, 3\}$

5 If $\{-2, 2\}$ is the set of zeroes of the function $f : f(x) = x^2 + a$, then $a =$ (Assiut 22)

- (a) -4 (b) 4 (c) 2 (d) -2

$(x+4)(x-4)$
 $(x-2)(x-3)$
 $x=2, x=3$

