EXERCISE 2.1

Write the correct answer in each of the following:
1. Which one of the following is a polynomial?

(A) $\frac{x^2}{2}-\frac{2}{x^2}$ (B) $\sqrt{2x}-1$

(C) $x^2+\frac{3x^{\frac{3}{2}}}{\sqrt{x}}$ (D) $\frac{x-1}{x+1}$

Solution:

(C)

$$x^2+\frac{3x^{\frac{2}{3}}}{\sqrt{x}}=x^2+3x$$

Explanation:

(A)

$$\frac{x^2}{2}-\frac{2}{x^2}=\frac{x^2}{2}-2x^{-2}$$

The equation contains the term x^2 and $-2x^{-2}$.
Here, the exponent of x in second term = – 2, which is not a whole number.
Hence, the given algebraic expression is not a polynomial.

(B)

$$\sqrt{2x}-1=\sqrt{2}x^{\frac{1}{2}}-1$$

The equation contains the term $\sqrt{2}x^{½}$.
Here, the exponent of x in first term = ½ , which is not a whole number.
Hence, the given algebraic expression is not a polynomial.

(C)

$$x^2+\frac{3x^{\frac{2}{3}}}{\sqrt{x}}=x^2+3x$$

The equation contains the term x^2 and 3x .
Here, the exponent of x in first term and second term= 2and 1 respectively, which is a whole number.
Hence, the given algebraic expression is a polynomial.

(D)

$$\frac{x-1}{x+1}$$

The equation is a rational function.
Here, the given equation is not in the standard form of polynomial.
Hence, the given algebraic expression is not a polynomial.

Hence, option C is the correct answer

2. $\sqrt{2}$ is a polynomial of degree

(A) 2
(B) 0
(C) 1
(D) ½

Solution:

(B) 0

Explanation:

$\sqrt{2}$ can be written as $\sqrt{2}x^0$

i.e., $\sqrt{2} = \sqrt{2}x^0$

Therefore, the degree of the polynomial = 0

Hence, option B is the correct answer

3. Degree of the polynomial $4x^4 + 0x^3 + 0x^5 + 5x + 7$ is

(A) 4
(B) 5
(C) 3
(D) 7

Solution:

(A) 4

Explanation:

Degree of a polynomial = Highest power of the variable in a polynomial.

The highest power of variable x in the polynomial $4x^4 + 0x^3 + 0x^5 + 5x + 7$ is 4.

Therefore, degree of the polynomial of $4x^4 + 0x^3 + 0x^5 + 5x + 7 = 4$

Hence, option A is the correct answer

4. Degree of the zero polynomial is

(A) 0
(B) 1
(C) Any natural number
(D) Not defined

Solution:

(D) Not defined

Explanation:

Degree of a zero polynomial is not defined.

Hence, option D is the correct answer

5. If $p(x)= x^2 – 2\sqrt{2}x + 1$, then $p(2\sqrt{2})$ is equal to

(A) 0
(B) 1
(C) $4\sqrt{2}$
(D) $8\sqrt{2} +1$

Solution:

(B) 1

Explanation:

According to the question,

$p(x) = x^2 - 2\sqrt{2}x + 1$

To get $p(2\sqrt{2})$,

We substitute $x = 2\sqrt{2}$,

$p(2\sqrt{2}) = (2\sqrt{2})^2 - (2\sqrt{2} \times (2\sqrt{2})) + 1$

$= (4 \times 2) - (4 \times 2) + 1$

$= 8 - 8 + 1$

$= 1$

Hence, option B is the correct answer

6. The value of the polynomial $5x - 4x^2 + 3$, when $x = -1$ is

(A) – 6

(B) 6

(C) 2

(D) – 2

Solution:

(A) – 6

Explanation:

According to the question,

$p(x) = 5x - 4x^2 + 3$

To get $p(-1)$,

We substitute $x = -1$,

$p(-1) = 5(-1) - 4(-1)^2 + 3$

$= 5(-1) - 4(1) + 3$

$= -5 - 4 + 3$

$= -9 + 3$

$= -6$

Hence, option A is the correct answer

7. If $p(x) = x + 3$, then $p(x) + p(-x)$ is equal to

(A) 3

(B) 2x

(C) 0

(D) 6

Solution:

(D) 6

Explanation:

$p(x) = x + 3$

$p(-x) = -x + 3$

Therefore,

$p(x) + p(-x) = (x + 3) + (-x + 3)$

$= x + 3 - x + 3$

$= 6$

Hence, option D is the correct answer

8. Zero of the zero polynomial is

(A) 0
(B) 1
(C) Any real number
(D) Not defined

Solution:

(C) Any real number
Explanation:
Zero polynomial is a constant polynomial whose coefficients are all equal to 0.
Zero of a polynomial is the value of the variable that makes the polynomial equal to zero.
Therefore, zero of the zero polynomial is any real number.
Hence, option C is the correct answer

9. Zero of the polynomial p(x) = 2x + 5 is

(A) – 2/5
(B) – 5/2
(C) 2/5
(D) 5/2

Solution:

(B) – 5/2
Explanation:
Zero of the polynomial ⇒ p(x) = 0
p(x) = 0
2x + 5 = 0
2x = – 5
x = – 5/2
Hence, option B is the correct answer

10. One of the zeroes of the polynomial $2x^2 + 7x - 4$ is

(A) 2
(B) ½
(C) – ½
(D) –2

Solution:

(B) ½
Explanation:
Zero of the polynomial ⇒ p(x) = 0
p(x) = 0
$2x^2 + 7x - 4 = 0$
$2x^2 - 1x + 8x - 4 = 0$
x(2x – 1) + 4(2x – 1) = 0
(x + 4)(2x – 1) = 0
Consider, x + 4
x + 4 = 0
x = – 4
Consider, 2x – 1

$2x - 1 = 0$
$2x = 1$
$x = ½$
Hence, option B is the correct answer