CHAPTER TEST

Mathematics-Basic

Time allowed : $1\frac{1}{2}$ hours | *Maximum Marks : 40*

General instructions :

(*i*) Do all the questions given in the chapter test.
(*ii*) Section–A consists of ten MCQs from 1 to 10 of 1 mark each.
(*iii*) Section–B consists of three questions from 11 to 13 of 2 marks each.
(*iv*) Section–C consists of four questions from 14 to 17 of 3 marks each.
(*v*) Section–D consists of three questions from 18 to 20 of 4 marks each.

SECTION–A

1. If p and q are two co-prime numbers, then HCF (p, q) is :
(A) p (B) q (C) pq (D) 1
[CBSE-**2011**-560026; **2010**-1040106-A2]

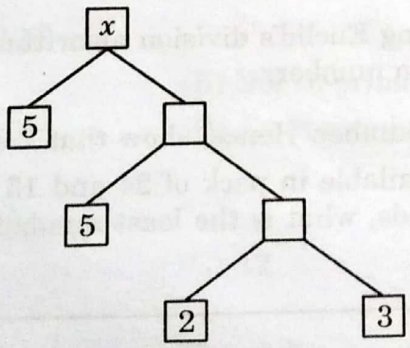
2. If d = HCF (48, 72), then the value of d is :
(A) 24 (B) 48 (C) 12 (D) 72
[CBSE-**2011**-560022; **2010**-1040106-B2]

3. If p and q are two consecutive natural numbers, then HCF (p, q) is :
(A) q (B) p (C) 1 (D) pq
[CBSE-**2010**-1040106-C2]

4. HCF of two consecutive even numbers is :
(A) 0 (B) 1 (C) 4 (D) 2
[CBSE-**2011**-560011]

5. If n is any natural number, then which of the following expressions ends with 0 :
(A) $(3 \times 2)^n$ (B) $(4 \times 3)^n$ (C) $(2 \times 5)^n$ (D) $(6 \times 2)^n$
[CBSE-**2010**-1040123-A1]

6. The value of x in the factor tree is :



(A) 30 (B) 150 (C) 100 (D) 50
[CBSE-**2011**-560014; **2010**-1040123-C1]

7. A pair of irrational number whose product is a rational number is :
(A) $\sqrt{16}$, $\sqrt{4}$ (B) $\sqrt{5}$, $\sqrt{2}$ (C) $\sqrt{3}$, $\sqrt{27}$ (D) $\sqrt{36}$, $\sqrt{2}$
[CBSE-**2011**-560033]

8. The rational number of decimal number $0.\overline{6}$ is :
(A) $\frac{33}{50}$ (B) $\frac{2}{3}$ (C) $\frac{111}{167}$ (D) $\frac{1}{3}$
[CBSE-**2010**-1040110-A1, A2]

9. The decimal expansion of the rational number $\frac{43}{2^4 \times 5^3}$ will terminate after :

(A) 3 places (B) 4 places (C) 5 places (D) 1 places

[CBSE-**2011**-560028]

10. The decimal expansion of $\frac{23457}{2^3 \times 5^4}$ will terminate after how many places of decimals ?

(A) 2 (B) 3 (C) 4 (D) 5

[CBSE-**2011**-560019, 560036]

SECTION–B

11. Use Euclid's Division Algorithm to find the HCF of 399 and 56.

12. Show that every even positive integer is of the form $5m + 1$ or $5m + 3$ for some odd integer m.

13. Express 18440 as product of its prime factors. Is it unique ?

SECTION–C

14. Prove that $\frac{7\sqrt{3}}{8}$ is an irrational number.

15. How many decimal places are there in decimal expansion of $\frac{11}{250}$?

16. Find the HCF and LCM of 540 and 72. Verify that HCF × LCM = Product of the two numbers.

17. Prove that $\sqrt{7}$ is an irrational number.

SECTION–D

18. What type of decimal expansion does an irrational number has ? How can you distinguish it from decimal expansions of rational numbers ?

19. Find the HCF of 324 and 54 using Euclid's division algorithm. Also, find their LCM and verify that HCF × LCM = Product of the two numbers.

20. Prove that $\sqrt{5}$ is an irrational number. Hence, show that $5+4\sqrt{5}$ is also an irrational number.

Answers

1. (D) **2.** (A) **3.** (C) **4.** (D) **5.** (C) **6.** (B)
7. (C) **8.** (B) **9.** (B) **10.** (C) **11.** HCF = 7
13. $2 \times 2 \times 2 \times 5 \times 461$, Unique **15.** Three **16.** HCF = 36, LCM = 360
18. Non-terminating non-repeating **19.** HCF = 54, LCM = 324

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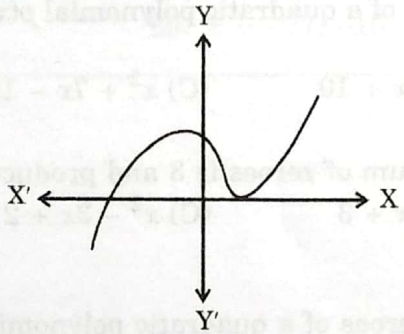
SECTION–A

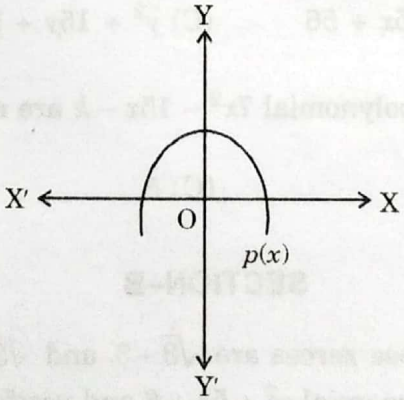
1. The graph of $y = p(x)$ is given below. The number of zeroes of $p(x)$ are :



(A) 0 (B) 3 (C) 2 (D) 4

[CBSE-**2011**-560011]

2. In figure, the graph of a polynomial $p(x)$ is shown, the number of zeroes of $p(x)$ is :



(A) 0 (B) 2 (C) 1 (D) None of these

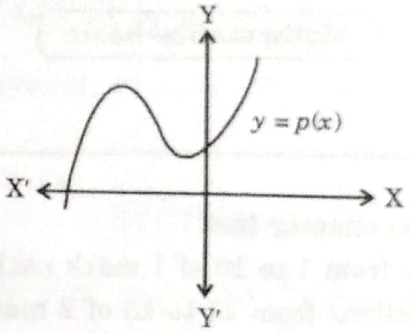
[CBSE-**2011**-560013, 560014]

3. The graph of the polynomial $p(x)$ intersects the x-axis three times in distinct points, then which of the following could be an expression for $p(x)$:

(A) $4 - 4x - x^2 - x^3$ (B) $3x^2 + 3x - 3$ (C) $3x + 3$ (D) $x^2 - 9$

[CBSE-**2011**-560015]

4. The number of zeroes for the polynomial $y = p(x)$ from the given graph is :



(A) 3 (B) 1 (C) 2 (D) 0

[CBSE-2011-560024]

5. If $p(x) = x^2 + 5x + 2$, then $p(3) + p(2) + p(0)$ is :

(A) 40 (B) 44 (C) 8 (D) 42

[CBSE-2011-560022]

6. The sum and the product of zeroes of a quadratic polynomial $p(x)$ are -7 and -10 respectively. Then, $p(x)$ is :

(A) $x^2 - 7x - 10$ (B) $x^2 - 7x + 10$ (C) $x^2 + 7x - 10$ (D) $x^2 + 7x + 10$

[CBSE-2011-560030]

7. The quadratic polynomial whose sum of zeroes is 3 and product of zeroes is -2 is :

(A) $x^2 + 3x - 2$ (B) $x^2 - 2x + 3$ (C) $x^2 - 3x + 2$ (D) $x^2 - 3x - 2$

[CBSE-2011-560027, 560035, 560038]

8. The sum and the product of the zeroes of a quadratic polynomial are $-\frac{1}{2}$ and $\frac{1}{2}$ respectively, then the polynomials is :

(A) $2x^2 + x + 1$ (B) $2x^2 - x + 1$ (C) $2x^2 - x - 1$ (D) $2x^2 + x - 1$

[CBSE-2011-560017, 560018]

9. The quadratic polynomial $p(y)$ with -15 and -7 as the sum and one of the zeroes respectively is :

(A) $y^2 - 15y - 56$ (B) $x^2 + 15x + 56$ (C) $y^2 + 15y + 56$ (D) $y^2 + 15y - 56$

[CBSE-2010-1040117-C1]

10. If the two zeroes of the quadratic polynomial $7x^2 - 15x - k$ are reciprocals of each other, the value of k is :

(A) -7 (B) -5 (C) 5 (D) 7

[CBSE-2011-560022]

SECTION–B

11. Find the quadratic polynomial whose zeroes are $\sqrt{3}+5$ and $\sqrt{3}-5$.
12. Find the zeroes of the quadratic plynomial $x^2 + 5x + 6$ and verify the relationship between the zeroes and the coefficients.
13. Divide $x^3 + 4x^2 + x - 6$ by $x^2 - 1$.

SECTION–C

14. If one zero of the polynomial $6x^2 + 15x + p$ is reciprocal of the other, then find the value of p. Also find the zeroes of the polynomial.
15. If α and β are zeroes of a polynomial $2x^2 - 7x + 6$, then form a quadratic polynomial whose zeroes are 2α and 2β.
16. Divide the polynomial $4x^3 - 7x^2 + 9x + 17$ by the polynomial $x^2 - 3x + 7$ and verify the division algorithm.

17. Check whether polynomial $x + 5$ is a factor of the polynomial $x^3 - 4x^2 + 3x - 15$. Verify by division algorithm.

SECTION–D

18. For what value of x both the polynomials $x^2 - 4x + 3$ and $x^2 + 4x - 21$ become zero ?
19. If one zero of the polynomial $x^2 + px + 10$ is 2, find the value of p and the other zero.
20. For what value of k, 7 is the zero of the polynomial $x^2 + 9x + (3k - 1)$? Also, find the other zero of the polynomial.

Answers

1. (C) **2.** (B) **3.** (A) **4.** (B) **5.** (B) **6.** (C)
7. (D) **8.** (A) **9.** (C) **10.** (A) **11.** $x^2 - 2\sqrt{3}x - 22$
12. $(x + 2)(x + 3)$ **13.** Quotient = $x + 4$, Remainder = $2x - 2$ **14.** $p = 6; -2, -\frac{1}{2}$
15. $x^2 - 7x + 12$ **16.** Quotient = $4x + 5$, Remainder = $-4x - 18$ **17.** No
18. 3 **19.** $p = -7; 5$ **20.** $k = -37; -16$

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SECTION–A

1. The graphical representation of the pair of equations $x + 2y - 4 = 0$ and $2x + 4y - 12 = 0$ is :

(A) intersecting lines (B) parallel lines (C) coincident lines (D) all the above

[CBSE-**2011**-560028, 560033]

2. The pair of linear equations $2x - 3y = 1$ and $3x - 2y = 4$ have :

(A) one solution (B) two solutions (C) no solution (D) many solutions

[CBSE-**2011**-560024, 560033]

3. If two lines are intersecting at a point, then their equations will have :

(A) one solution (B) infinitely many solutions

(C) no solution (D) two solutions

[CBSE-**2011**-560029]

4. The pair of linear equations $x - 2y = 5$ and $2x - 4y = 10$ has :
(A) infinitely many solutions (B) no solution
(C) one solution (D) two solutions

5. The pair of linear equations $2x + 3y - 5 = 0$ and $3x - 2y + 5 = 0$ has : [CBSE-2011-560016]
(A) unique solution (B) no solution (C) two solutions (D) infinite solutions

6. If the pair of equations $2x + 3y - 5 = 0$ and $4x + ky - 10 = 0$ has infinite number of solutions, then : [CBSE-2011-560021]
(A) $k = \frac{3}{2}$ (B) $k = 6$ (C) $k \neq \frac{3}{2}$ (D) $k \neq 6$

7. If the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has infinite number of solutions, then the relation among the coefficients is : [CBSE-2011-560036]
(A) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (C) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (D) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} = \frac{c_1}{c_2}$

8. The pair of linear equations $2x + 5y = 3$ and $6x + 15y = 12$ represents : [CBSE-2011-560019]
(A) intersecting lines (B) parallel lines (C) coincident lines (D) none from A, B, C

[CBSE-2010-1040110-A2]

SECTION–B

9. Find whether the lines representing the following pair of linear equations intersect at a point, are parallel or coincident :
$x + 2y - 5 = 0$
$3x + 6y - 15 = 0$

10. If sum of two positive numbers is 128 and the difference of these numbers is 18, then find the numbers.

11. Find whether the following pair of linear equations is consistent or inconsistent :
$\frac{3}{2}x + 2y - 12 = 0,\ 5x - \frac{20}{3}y + 20 = 0$

12. Given the linear equation $2x - 5y + 7 = 0$, write another linear equaiton in these two variables such that the geometrical representation of the pair so formed is :
(*i*) intersecting lines (*ii*) parallel lines.

SECTION–C

13. Draw the graph of $3x - y = 3$ and $2x + 3y = 13$. Shade the region bounded by these lines and x-axis. Find the area of the shaded region.

14. Solve by substitution :
$x + y = 7$
$2x - y = 5$

15. The difference of two numbers is 58. If one number is three times the other, find the numbers.

16. Six chairs and two tables cost ₹ 6600, whereas four chairs and one table cost ₹ 4000. Find the cost of a chair and a table separately.

SECTION–D

17. Solve by elimination :
$7x + 9y = 23$
$2x + 11y = 15$
Hence, find the value of p such that $px + 9y = 15$.

18. Solve graphically the following pair of linear equations :

$3x - 4y + 3 = 0$

$3x + 4y - 21 = 0$

Hence, shade the region enclosed by these lines and y-axis.

19. Draw the graph of the pair of equations :

$5x - 7y + 50 = 0$ and $5x + 7y - 20 = 0$.

Also, find the points, where the lines meet the x-axis.

Answers

1. (B) **2.** (A) **3.** (A) **4.** (A) **5.** (A) **6.** (B)

7. (B) **8.** (B) **9.** Coincident **10.** 55, 73 **11.** Consistent

12. (*i*) $x - y = -2$ (*ii*) $4x - 10y + 12 = 0$

Note : The answers of this question are not unique.

13. 8.25 sq. units **14.** $x = 4, y = 3$ **15.** 29, 87

16. ₹ 700, ₹ 1200 **17.** $x = 2, y = 1; p = 3$ **18.** $x = 3, y = 3$

19. (–10, 0), (4, 0).