MATHEMATIC (STANDARD)

SET I

SECTION-A

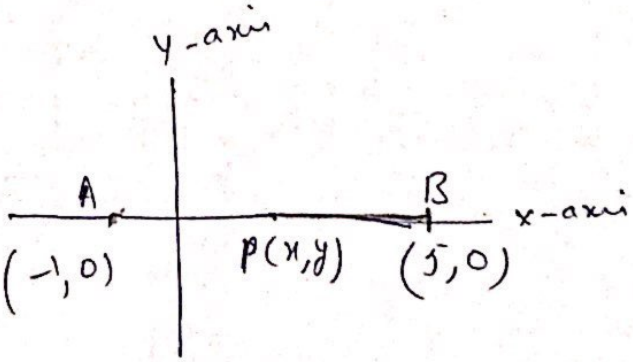
1. The point P on x-axis equidistant from the points A(-1, 0) and B(5, 0) is

(a) (2, 0) (b) (0, 2) (c) (3, 0) (d) (2, 2)

x-अक्ष पर स्थित वह बिंदु P जो बिंदुओं A(-1, 0) और B(5, 0) से समदूरस्थ है

(a) (2, 0) (b) (0, 2) (c) (3, 0) (d) (2, 2)

Solution



$AP = PB$

$\Rightarrow$ P is the mid point

so mid point of AB is

$$\left(\frac{-1+5}{2}, \frac{0+0}{2}\right)$$

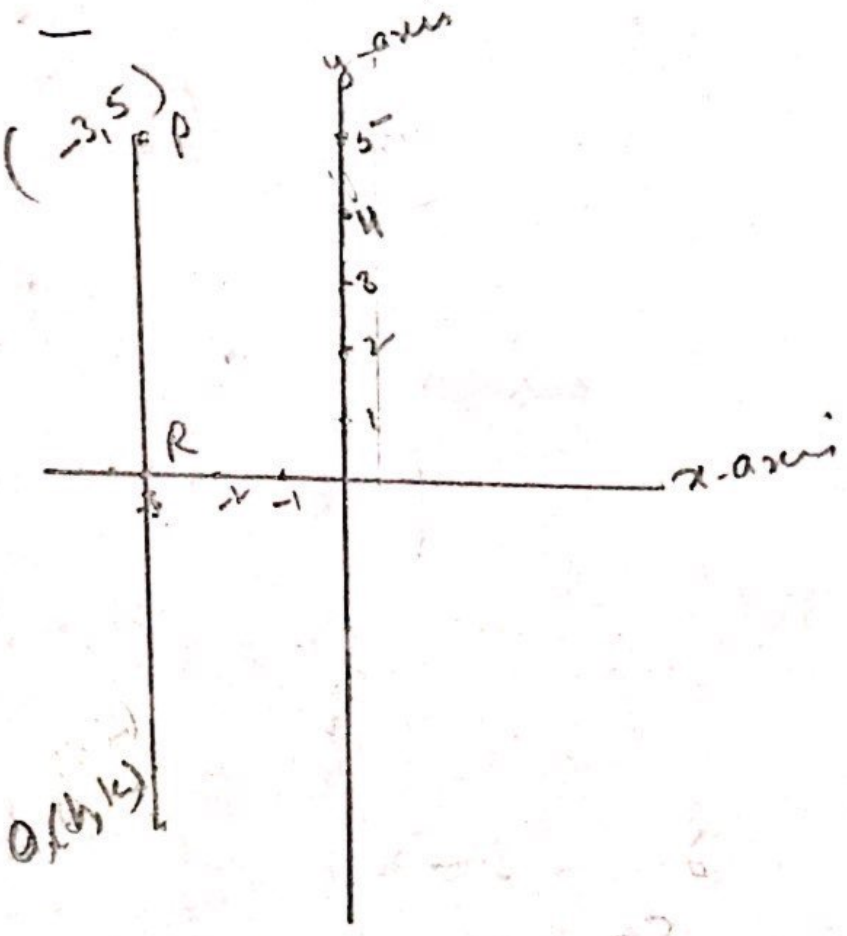
$$\left(\frac{4}{2}, 0\right)$$

$$(2, 0)$$

(a)

2 The co-ordinates of the point which is reflection of point $(-3, 5^-)$ in x-axis are

(a) $(3, 5^-)$ (b) $(3, -5^-)$ (c) $(-3, -5^-)$ (d) $(-3, 5)$



P Coordinate of P = $(-3, 5^-)$

Co-ordinate of R = $(-3, 0)$

Find co-ordinate of Q.

$\frac{h-3}{2} = -3 \quad h-3 = -6 \quad h = -3$

$\frac{k+5^-}{2} = 0 \quad k+5^- = 0 \quad k = -5^-$

$(h, k) = (-3, -5^-)$

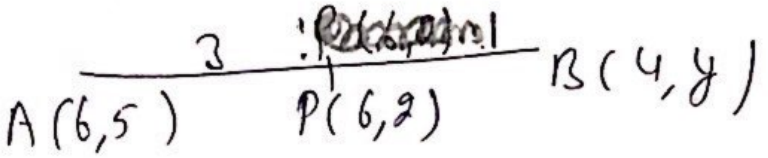
3. If the point $P(6, 2)$ divides the line segment joining $A(6, 5)$ & $B(4, y)$ in the ratio 3:1 Then the value of y is

(a) 4 (b) 3 (c) 2 (d) 1

यदि बिंदु $P(6, 2)$ रेखाखंड AB को जो $A(6, 5)$ तथा $B(4, y)$ को मिलाने वाला है 3:1 के अनुपात में विभाजित करता है तो y का मान है

(a) 4 (b) 3 (c) 2 (d) 1

Solution



$$2 = \frac{3y + 5}{3 + 1}$$

$$2 = \frac{3y + 5}{4}$$

$$3y + 5 = 8 \quad , 3y = 3 \quad , y = 1$$

(d)

4. The sum of exponents of prime factors in the prime factorisation of 196 is

(a) 3 (b) 4 (c) 5 (d) 2.

1. 196 का अभाज्य गुणनखण्ड में अभाज्य गुणनखण्ड का घातों का योगफल है

(a) 3 (b) 4 (c) 5 (d) 2.

Solution $196 = 2^2 \times 7^2$

$2 + 2 = 4$

2|196
2|98
7|49
7

(b)

(8) The zeroes of polynomial $x^2 - 3x - m(m+3)$ are

(a) $m, m+3$ (b) $-m, m+3$ (c) $m, -(m+3)$

(d) $-m, -(m+3)$

ગુજરાતી $x^2 - 3x - m(m+3)$ ના શૂન્યો

(a) $m, m+3$ (b) $-m, m+3$ (c) $m, -(m+3)$

(d) $-m, -(m+3)$

Solution :-

$$x^2 - 3x - m(m+3)$$

$$x^2 - 3x - m^2 - 3m$$

$$x^2 - m^2 - 3x - 3m$$

$$(x+m)(x-m) - 3(x+m)$$

$$(x+m)(x-m-3)$$

For zeroes

$$(x+m)(x-m-3) = 0$$

$x + m = 0$ $\quad$ $x - m - 3 = 0$

$x = -m$ $\quad$ $x = m+3$

So zeroes are $-m, m+3$

(c)

7. The value of k for which the system of linear equation $x + 2y = 3$, $5x + ky + 7 = 0$ is inconsistent is

(a) $-\frac{14}{3}$ (b) $\frac{2}{5}$ (c) 5 (d) 10

k का वह मान जिसके लिए रैखिक समीकरण निकाय $x + 2y = 3$, $5x + ky +$ असंगत है

(a) $-\frac{14}{3}$ (b) $\frac{2}{5}$ (c) 5 (d) 10

Solution $x + 2y = 3$

$5x + ky + 7 = 0$.

For linear equations to be inconsistent

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

$$\frac{1}{5} = \frac{2}{k} \neq \frac{-3}{7}$$

$$\frac{1}{5} = \frac{2}{k} \Rightarrow k = 10$$

(d)

8. The roots of the quadratic equation $x^2 - 0.04 = 0$ are

(a) ± 0.2 (b) ± 0.02 (c) 0.4 (d) 2.

(a) ± 0.2 (b) ± 0.02 (c) 0.4 (d) 2

Solution

$$x^2 - 0.04 = 0$$

$$x^2 = 0.04$$

$$x = \pm 0.2$$

(a)

9. The common difference of the AP

$\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \ldots\ldots$ is

(a) 1 (b) $\frac{1}{p}$ (c) -1 (d) $-\frac{1}{p}$

समांतर श्रेढी $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \ldots$

चा। सार्व अंतर ??

(a) 1 (b) $\frac{1}{p}$ (c) -1 (d) $-\frac{1}{p}$

Solution

$$d = \frac{1-p}{p} - \frac{1}{p}$$

$$\frac{1-p-1}{p} = \frac{-p}{p} = -1$$

(c)

10 The n^{th} term of the A.P

$a, 3a, 5a \ldots$ is

(a) na (b) $(2n-1)a$ (c) $(n+1)a$ (d) $2na$

समांतर श्रेढी $a, 3a, 5a \ldots$ वा

n वा पद $\frac{2}{3}$

(a) na (b) $(2n-1)a$ (c) $(2n+1)a$ (d) $2na$

Solution first term $= a$.

$$d = 3a - a = 2a.$$

$$a_n = a + (n-1)d$$

$$= a + (n-1)(2a)$$

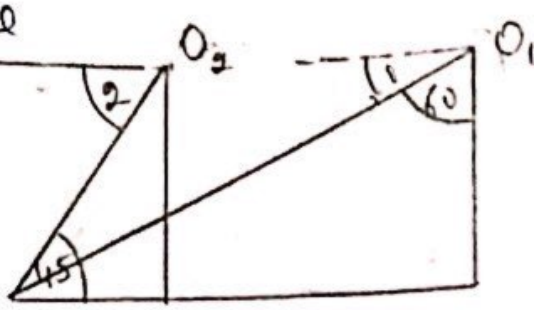
$$= a + 2na - 2a$$

$$= 2na - a$$

$$= (2n-1)a$$

(b)

11. The angles of depression from the observing positions O_1 and O_2 respectively of the object A are



Solution $\angle 1$ = angle of depression at O_1 = अवनमन कोण O_1 पर

$= 90 - 60 = 30$

$\angle 2$ = angle of depression at O_2 = अवनमन कोण O_2 पर

$= 45$

So answer = $30°, 45°$

12. In ΔABC $AB = 6\sqrt{3}$ cm. $AC = 12$ cm and $BC = 6$ cm then $\angle B =$ ____

In ΔABC AB = 6√3 cm AC = 12 cm
and BC = 6 cm then ∠B = ____

दिया ΔABC में AB = 6√3 सेमी AC = 12
और BC = 6 सेमी ∠B का माप

Solution $AB = 6\sqrt{3}$ cm $AB^2 = 108$

$AC = 12$ cm $AC^2 = 144$

$BC = 6$ cm $BC^2 = 36$

$\Rightarrow AC^2 = AB^2 + BC^2$ [$\because 144 = 108 + 36$
$144 = 144$]

$\Rightarrow \angle B = 90^\circ$

or.

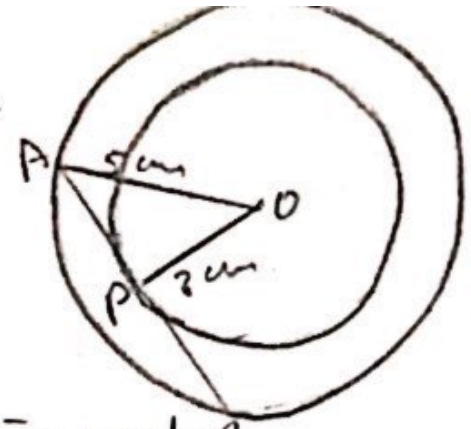
(12) Two triangles are similar if their corresponding sides are ——

दो त्रिभुज समरूप होते हैं यदि उनकी संगत भुजाएँ —— हैं।

Solution proportional

13 In given fig
the length PB = —— cm.

दी गई आकृति में
लंबाई PB = —— cm



$\angle P = 90^\circ$ [∵ The tangent to a circle is perpendicular to the radius at point of contact.)

$AP^2 = OA^2 - OP^2$

$= (5)^2 - (3)^2$

$= 25 - 9$

$= 16$

$AP^2 = 16$

$AP = 4$

$AP = PB$ [Perpendicular from the centre to the chord bisect. the ch

$\Rightarrow PB = 4$ cm.

Stand 3

15. The value of $\sin 32^\circ \cos 58^\circ + \cos 32^\circ \sin 58^\circ$

$\sin 32^\circ \cos 58^\circ + \cos 32^\circ \sin 58^\circ$ का मान बराबर

= ——

$\sin 32 \cos 58 + \cos 32 \sin 58$

$\sin 32 \cos(90-32) + \cos 32 \sin(90-32)$

$\sin 32 \sin 32 + \cos 32 \cos 32$

$\sin^2 32 + \cos^2 32$

1

or.

15 The value of $\frac{\tan 35^\circ}{\cot 55^\circ} + \frac{\cot 78^\circ}{\tan 12^\circ}$ is —

$\frac{\tan 35^\circ}{\cot 55^\circ} + \frac{\cot 78^\circ}{\tan 12^\circ}$ का मान ——

Solution $\frac{\tan 35}{\cot 55} + \frac{\cot 78}{\tan 12}$

$\frac{\tan(90-55)}{\cot 55} + \frac{\cot(90-12)}{\tan 12}$

$\frac{\cot 55}{\cot 55} + \frac{\tan 12}{\tan 12}$

$1 + 1$

2

16 A die is thrown once what is probability of getting a prime number

एक पासा एक बार उछाला गया. एक अभाज्य संख्या के आने की प्रायिकता क्या है

$S = \{1, 2, 3, 4, 5, 6\}$

$P(\text{a prime number}) =$

$P(2, 3, 5) = \frac{3}{6} = \frac{1}{2}$

17 यदि a number x is chosen at random from the numbers $-3, -2, -1, 0, 1, 2, 3$ Then find the probability of $x^2 < 4$

यदि संख्याओं $-3, -2, -1, 0, 1, 2, 3$ में से एक संख्या x यादृच्छया चुना गया है तो $x^2 < 4$ की प्रायिकता ज्ञात कीजिए

$$x^2 < 4$$
$$x^2 - 4 < 0$$
$$(x+2)(x-2) < 0$$
$$-2 < x < 2$$
$$P(-2 < x < 2) = P(-1, 0, 1) = \frac{3}{7}$$

or

17 What is the probability that a random taken leap year has 52 Sundays

किसी लीप वर्ष में 52 रविवार होने की प्रायिकता क्या है

Solution - A leap year has 366 days

$52 \times 7 + 2$

So there are 52 Sundays but there are two extra days

These two extra days are

(Sunday, Monday), (Monday, Tuesday)
(Tuesday, wednesday), (wednesday, Thursday)
(Thursday, Friday), (Friday, Saturday)
(Saturday Sunday)

Now we are to find probability of having 52 Sundays

so from the combination listed above leave two combinations

I (Sunday, Monday) II (Saturday, Sunday)

So ~~some~~ number of remaining combination $= 5$

So Probability of getting 52 Sundays $= \frac{5}{7}$

19. Find the area of the sector of a circle of radius 6 cm whose angle is 30° (Take $\pi = 3.14$)

6 सेमी त्रिज्या के वृत्त के 32 का परिमाप ज्ञात कीजिए जिस के चाप का कोण 30° का है (π

$\theta = 30°$ $r = 6$ cm

Area of sector $= \frac{\theta}{360} \times \pi r^2$

$= \frac{30}{360} \times 3.14 \times$

$= \frac{\cancel{30}}{\cancel{360}} \times \frac{314}{100} \times$

$= \frac{942}{100}$

$= 9.42$ cm

20 Find the class marks of the classes 20-50 and 35-60

वर्ग 20-50 तथा 35-60 के वर्ग चिह्न ज्ञात कीजिए

Class mark of 20-50 = $\frac{20+50}{2} = \frac{70}{2}$

$= 35$

Class mark of 35-60 = $\frac{35+60}{2}$

$= \frac{95}{2} = 47.5$