TARGET MATHEMATICS
THE EXCELLENCE KEY
AGYAT GUPTA (M.Sc., M.Phil.)

22 YEAR OF QUALITY EDUCATION

GENERAL INSTRUCTIONS :-

CODE:- AG-11

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A,B,C and D. Section – A comprises of 8 question of 1 mark each. Section – B comprises of 6 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 10 questions of 4 marks each.
3. Question numbers 1 to 8 in Sections – A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four mark each. You have to attempt only one lf the alternatives in all such questions.
5. Use of calculator is not permitted.
6. Please check that this question paper contains 6 printed pages.

MATHEMATICS CLASS X (SA-1)

Time : 3 to $3\frac{1}{4}$ Hours Maximum Marks : 90

SUMMATIVE ASSESSMENT –I (2013)

SECTION A

Q.1 If the HCF of 55 and 99 is expressible in the form 55 m - 99, then the value of m is

(A) 4 (B) 2 (C) 1 (D) 3 Ans. B

Q.2 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 Ans. D

Q.3 If in ΔABC and $\Delta DEF, \frac{AB}{DE}=\frac{BC}{FD}$, then they will be similar triangles if

(A) $\angle B=\angle E$ (B) $\angle A=\angle D$ (C) $\angle B=\angle D$ (D) $\angle A=\angle F$ Ans. C

Q.4 If $\cos(40°+A)=\sin 30°$, then value of A is

(A) 30° (B) 40° (C) 60° (D) 20° Ans. D

Q.5 If $3\cos\theta=2\sin\theta$, then the value of $\frac{4\sin\theta-3\cos\theta}{2\sin\theta+6\cos\theta}$ is

(A) $\frac{1}{8}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{1}{4}$ Ans. B

Q.6 Given that LCM(91, 26) = 182, then HCF(91, 26) is

(A) 13 (B) 26 (C) 7 (D) 9 Ans. A

Q.7 One equation of a pair of dependent linear equations is $-5x + 7y = 2$, the second equation can be

(A) $10x+14y+4=0$ (B) $-10x-14y+4=0$

(C) $-10x+14y+4=0$ (D) $10x-14y=-4$ Ans. D

Q.8 If $\operatorname{cosec}\theta-\cot\theta=\frac{1}{3}$, then value of $(\operatorname{cosec}\theta+\cot\theta)$ is

(A) 1. (B) 2 (C) 3 (D) 4

Ans. C

SECTION B

Q.9 If $\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$, by using $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$, prove that A + B = 45°.

Q.10 Calculate the mode of the following data

Classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	5	10	18	30	20	12	5

Ans. Modal class : $30-40$, $f_0 = 18$, $f_1 = 30$, $f_2 = 20$, $h = 10$

$$\text{Mode} = 30 + \frac{30 - 18}{2 \times 30 - 18 - 20} \times 10 = 35.45$$

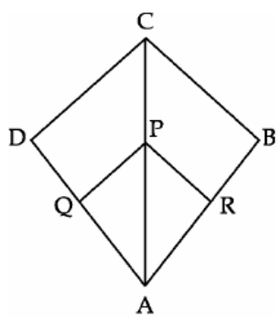
Q.11 Without actually performing the long division, state whether $\frac{13}{3125}$ has terminating decimal expansion or not.

Sol. $\frac{13}{3125} = \frac{13}{2^0 \times 5^5}$. This, shows that the prime factorization of the denominator is of the form $2^m \times 5^n$. Hence, it has terminating decimal expansion.

OR

Write the condition to be satisfied by q so that a rational number $\frac{p}{q}$ has a terminating decimal expansion. **Ans :** rational number $\frac{p}{q}$ if q is in the form of $2^m \times 5^n$.

Q.12 In the figure below, PQ||CD and PR||CB. Prove that $\frac{AQ}{QD} = \frac{AR}{RB}$.



Ans. In ΔACD, PQ||CD

$\frac{AQ}{QD} = \frac{AP}{PC}$ (Basic proportionality theorem) ..... (i)

In ΔACB, PR||CB

$\frac{AR}{RB} = \frac{AP}{PC}$ ..... (ii)

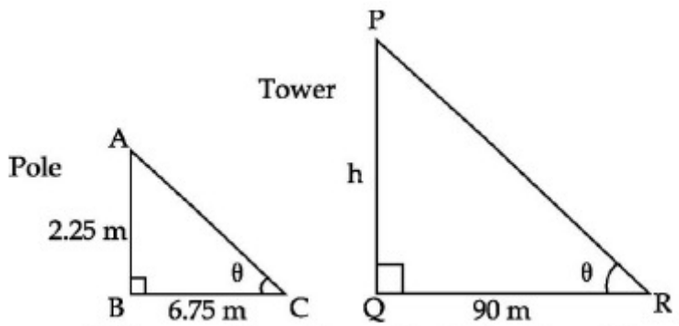
From (i) and (ii)

$\Rightarrow \frac{AQ}{QD} = \frac{AR}{RB}$

Q.13 Find the median of the following data : 5 , 17 , 23 , 14 , 29 , 11 ,

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

	43 , 13 , 53 , 36 . If 13 , 23 is replace by 72 , 49 . what will be the new median . ans; median = 20 and new median = 65/2 ie = 32 . 5
Q.14	A vertical pole which is 2.25m long cast a 6.75m long shadow on the ground. At the same time, a vertical tower casts a 90m long shadow on the ground. Find the height of the tower. ANS:



∵ At the same time the angle of elevation of the sum is same

∴ $\angle ACB = \angle PRQ$

$\angle ABC = \angle PQR = 90°$

By AA similarity $\Delta ABC \sim \Delta PQR$ 3

∴ $\frac{AB}{PQ} = \frac{BC}{QR}$

$\frac{2.25}{h} = \frac{6.75}{90}$

$h = 30$ m

	SECTION C
Q.15	If $\cos ec(A-B) = 2, \cot(A+B) = \frac{1}{\sqrt{3}}, 0° < (A+B) \le 90°$, then find A and B. Ans. $\text{cosec}\,(A-B) = 2$ and $\cot(A+B) = \frac{1}{\sqrt{3}}$

$\sin(A-B) = \frac{1}{2}$

$A-B = 30°$ — (1) $A+B = 60°$ — (2)

Solving (1) and (2) we get

$A = 45°$ and $B = 15°$

Q.16 The sum of the numerator and denominator of a fraction is 12. If 1 is added to both the numerator and the denominator the fraction becomes $\frac{3}{4}$. Find the fraction.

Ans. Let the fraction be $\frac{x}{y}$

According to the question

$x+y=12$

$\frac{x+1}{y+1} = \frac{3}{4} \Rightarrow 4x-3y=-1$ 4

Solving and getting $x=5, y=7$

The fraction is $\frac{5}{7}$

OR

A man travels 600 km partly by train and partly by car. It takes 8 hours and 40 minutes if he travels 320 km by train and the rest by car. It would take 30 minutes more if he travels 200 km by train and the rest by car. Find the speed of the train and the car

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

separately. Ans. Let the speed of the train be x km/hr
Let the speed of the car be y km/hr

ATQ : $\frac{320}{x} + \frac{280}{y} = 8\frac{40}{60} = \frac{26}{3}$

$\frac{160}{x} + \frac{140}{y} = \frac{13}{3}$ _____ (1) × 1

$\frac{200}{x} + \frac{400}{y} = 9\frac{10}{60} = \frac{55}{6}$

$\frac{40}{x} + \frac{80}{y} = \frac{11}{6}$ _____ (2) × 4

$\frac{160}{x} + \frac{140}{y} = \frac{13}{3}$

$\frac{160}{x} + \frac{320}{y} = \frac{44}{6}$

$\frac{-180}{y} = \frac{18}{6}$

$\therefore \quad y = 60$

$\frac{40}{x} + \frac{80}{60} = \frac{11}{6}$

$\frac{40}{x} = \frac{11}{6} - \frac{8}{6} = \frac{3}{6} = \frac{1}{2}$

$\therefore \quad x = 80$

Speed of the train is 80 km/hr
Speed of the car is 60 km/hr

Q.17 Prove that $\frac{1+\cos A}{\sin A} + \frac{\sin A}{1+\cos A} = 2\cos ecA$ Ans.

$$LHS = \frac{(1+\cos A)^2 + \sin^2 A}{\sin A\,(1+\cos A)}$$

$$= \frac{1+2\cos A + \cos^2 A + \sin^2 A}{\sin A\,(1+\cos A)}$$

$$= \frac{2\,(1+\cos A)}{\sin A\,(1+\cos A)}$$

$$= \frac{2}{\sin A} = 2\,\mathrm{cosec}A = RHS$$

.

Q.18 Find the zeroes of the quadratic polynomial x^2+5x+6 and verify the relationship between the zeroes and the coefficients

Ans. $f(x) = x^2+5x+6 = (x+3)(x+2)$

zeroes of polynomial are -3 and -2

Sum of zeroes $= -5$ _____ (i)

$\frac{\text{coefficient of } x}{\text{coefficient of } x^2} = -\frac{5}{1} = -5$ _____ (ii)

(i) = (ii)

Product of zeroes $= (-3) \times (-2) = 6$ _____ (iii)

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

$$\frac{\text{Constant term}}{\text{Coefficient of } x^2} = \frac{6}{1} = 6 \quad \text{_____ (iv)}$$

(iii) = (iv)

Q.19 On dividing the polynomial $4x^4 - 5x^3 - 39x^2 - 46x - 2$ by the polynomial g(x), the quotient and remainder were $x^2 - 3x - 5$ and $-5x + 8$ respectively. Find $g(x)$. Ans.

$p(x) = 4x^4 - 5x^3 - 39x^2 - 46x - 2$

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

$r(x) = -5x + 8$

$$g(x) = \frac{p(x) - r(x)}{q(x)}$$

$$= \frac{4x^4 - 5x^3 - 39x^2 - 41x - 10}{x^2 - 3x - 5}$$

$$\begin{array}{r|l} & 4x^2 + 7x + 12 \\ \hline x^2 - 3x - 5 & 4x^4 - 5x^3 - 39x^2 - 41x - 10 \\ & 4x^4 - 12x^3 - 20x^2 \\ \hline & 7x^3 - 19x^2 - 41x - 10 \\ & 7x^3 - 21x^2 - 35x \\ \hline & 2x^2 - 6x - 10 \\ & 2x^2 - 6x - 10 \\ \hline & 0 \end{array}$$

$g(x) = 4x^2 + 7x + 2$

Q.20 Check whether 4^n can end with digit zero for any natural number n.ANS

If a number 4^n, for any natural number n ends with digit 0, then it is divisible by 5.

The prime factorization of 4^n must contain the prime factor 5.

This is not possible because prime factors of 4^n is 2 only and the uniqueness of Fundamental theorem of arithmetic guarantees that there are no other prime in factorisation of 4^n.

Hence 4^n can never end with the digit zero for $n \in N$.

OR

Show that the square of any positive odd integer is of the form 8m + 1, for some integer m. ANS

Let 'n' be a positive odd Integer

Then $n = 4q + 1$ or $4q + 3$

$n^2 = (4q+1)^2$ or $(4q+3)^2$

$= 8(2q^2 + q) + 1$ or $8(2q^2 + 3q + 1) + 1$

$= 8m + 1$ where $m = (2q^2 + q)$ or $m = 2q^2 + 3q + 1$

Hence $n^2 = 8m + 1$ for some integer m.

Q.21 The mean of the following data is 53, find the missing frequencies.

Classes	0-20	20-40	40-60	60-80	80-100	Total

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

No. of Students	15	f_1	21	f_2	17	100

Ans.

Age (in years)	No. of people f_i	Mid values x_i	$f_i x_i$
$0-20$	15	10	150
$20-40$	f_1	30	$30 f_1$
$40-60$	21	50	1050
$60-80$	f_2	70	$70 f_2$
$80-100$	17	90	1530
Total	100		$(2730+30 f_i+70 f_2)$

5

$53+f_1+f_2=100$

$f_1+f_2=47$ _____ (1)

$$\frac{2730+30f_1+70f_2}{100}=53$$

$5300-2730=30f_1+70f_2$

$30f_1+70f_2=2570$

or $3f_1+7f_2=257$ _____(2)

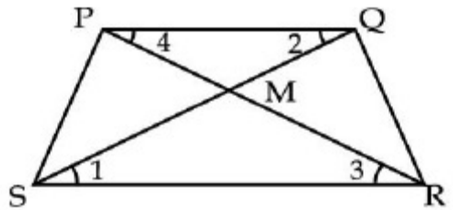
$$\frac{3f_1+3f_2=141}{4f_2=116}$$

$$f_2=\frac{116}{4}=29$$

$f_1+f_2=47$

$f_2=47-29=18$

Q.22 PQRS is a trapezium with PQ||SR. Diagonals PR and SQ intersect at M. $\Delta PMS \sim \Delta QMR$. Prove that $PS=QR$. Ans.



6

In ΔMSR and ΔMQP

$\angle 1=\angle 2$

$\angle 3=\angle 4$

$\therefore$ $\Delta MSR \sim \Delta MQP$ [AA similarity]

$$\Rightarrow \quad \frac{MS}{MQ}=\frac{MR}{MP}$$

$$\Rightarrow \quad \frac{MS}{MR}=\frac{MQ}{MP} \qquad (1)$$

Also, $\Delta PMS \sim \Delta QMR \Rightarrow \frac{PM}{QM}=\frac{MS}{MR}=\frac{PS}{QR}$ (2)

From (1), (2) $\frac{MQ}{MP}=\frac{PM}{QM}$

$\Rightarrow \quad QM^2=PM^2$

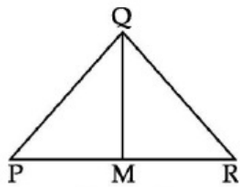
$\Rightarrow \quad QM=PM$ (3)

From (1), (3) $\frac{MS}{MR}=1 \Rightarrow MS=MR$ (4)

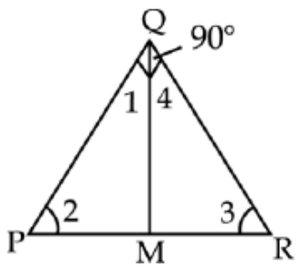
From (2), (3), (4) $\Rightarrow \quad \frac{PS}{QR} = 1 \quad \Rightarrow \quad PS = QR$

Q.23 In fig. PQR is a triangle in which $QM \perp PR$ and $PR^2 - PQ^2 = QR^2$.

Prove that $QM^2 = PM \times MR$



.Ans.



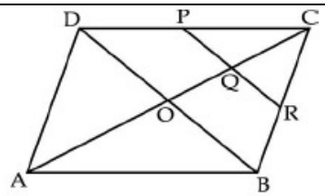
OR $PR^2 = QR^2 + PQ^2 \Rightarrow$ PQR is right angled at Q

$\angle 2 + \angle 3 = 90°; \angle 1 + \angle 2 = 90° \Rightarrow \angle 1 = \angle 3, \angle 2 = \angle 4$

$\Delta PMQ \sim \Delta QMR$ (AA)

$$\frac{PM}{QM} = \frac{QM}{MR} \Rightarrow MQ^2 = PM \times MR$$

In given figure ABCD is a parallelogram such that diagonals AC, BD intersect at O. IF P is mid-point of CD and $CQ = \frac{1}{4}AC$. Prove that R is mid-point of



BC.

SOL:

In a parallelogram, diagonals bisect each other

$\therefore \quad OC = \frac{1}{2}AC \qquad (1)$

Now, in ΔBCD, P is mid-point of CD

and $CQ = \frac{1}{4}AC \quad \Rightarrow \quad CQ = \frac{1}{2}\left(\frac{1}{2}AC\right)$

$\Rightarrow \quad CQ = \frac{1}{2}OC$

$\Rightarrow$ Q is mid-point of OC

Now in ΔDOC, P is mid-point of DC and Q is mid-point of OC

$\Rightarrow \quad \frac{CP}{PD} = \frac{CQ}{QO}$

$\Rightarrow \quad PQ \| DO$ [By converse of BPT]

$\Rightarrow \quad PR \| DB$

In ΔCDB, $PR \| DB$

$\Rightarrow \quad \frac{CP}{PD} = \frac{CR}{RB}$

But $\frac{CP}{PD} = 1$

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

$\Rightarrow \quad \frac{CR}{RB} = 1$

$\Rightarrow \quad CR = RB$ ANS

In ΔACD and ΔAEC

$\angle ACD = \angle AEC = 90°$

$\angle CAD = \angle EAC$ [common]

$\therefore \quad \Delta ACD \sim \Delta AEC$ [AA similarity]

$\therefore \quad \frac{AC}{AE} = \frac{AD}{AC}$

$\Rightarrow \quad AC^2 = AE.AD$

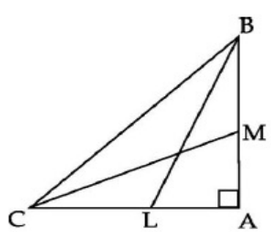
Q.24 For which values of a and b does the following pair of linear equations have an infinite number of solutions?

$(a-b)x + (a+b)y = 3a + b - 2$; $2x + 3y = 7$.

Ans. $a = 5, b = 1$

SECTION D

Q.25 In Figure, BL and CM are medians of ΔABC right angled at A.



Prove that $4(BL^2 + CM^2) = 5BC^2$.

Ans.

In ΔBAL

$BL^2 = \left(\frac{AC}{2}\right)^2 + AB^2$

$4BL^2 = AC^2 + 4AB^2$ _____ (1)

In ΔCAM

$CM^2 = CA^2 + \frac{AB^2}{4} \Rightarrow 4CM^2 = 4CA^2 + AB^2$ _____ (2)

(1) + (2)

$4(BL^2 + CM^2) = 5[AC^2 + AB^2]$

$= 5BC^2$ [By Pythagorous theorem]

Q.26 Solve graphically the pair of liner equations.

$x - y = -1$ and $2x + y - 10 = 0$. Also find the area of the region bounded by these lines and x-axis. Ans. Tabular column

Plotting the points and drawing

The correct graph

Solution $x = 3$ $y = 4$ and

Area = 12 sq. units

Q.27 Find the median by drawing both types of ogives.

Classes	50-60	60-70	70-80	80-90	90-100

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

interval					
Frequency	3	5	9	12	6

Ans.

Class	f	Less than cf	More cf
50 - 60	3	3	35
60 - 70	5	8	32
70 - 80	9	17	27
80 - 90	12	29	18
90 - 100	6	35	6

Correct Less than ogive

Correct More than ogive

Corrected Located median

Q.28 Divide $2x^4 - 9x^3 + 5x^2 + 3x - 8$ by $x^2 - 4x + 1$ and verify the division algorithm. Ans.

$(2x^4 - 9x^3 + 5x^2 + 3x - 8) \div (x^2 - 4x + 1)$ gives

$2x^2 - x - 1$ as quotient and -7 as remainder

Verification, (Quotient $\times$ Divisor) + Remainder = Divident

Q.29 An army contingent of 616 members is to march behind and army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

ANS

Let x be the maximum number of columns in which the two groups can march.
x is HCF of 616 and 32.
By Euclid's division algorithm
$616 = 32 \times 19 + 18$
$32 = 8 \times 4 + 0$
HCF $(616, 32) = 8$
Hence the maximum number of columns in which they can march is 8. An

s: 8 columns

Q.30 If $\sec\theta = x + \frac{1}{4x}$, then prove that $\sec\theta + \tan\theta = 2x$ or $\frac{1}{2x}$.

Ans. $\sec^2\theta - 1 = \tan^2\theta$

7

$$\tan^2\theta = \left(x - \frac{1}{4x}\right)^2$$

$$\tan\theta = \pm\left(x - \frac{1}{4x}\right)$$

$$\sec\theta + \tan\theta = x + \frac{1}{4x} + x - \frac{1}{4x} = 2x$$

$$\sec\theta + \tan\theta = x + \frac{1}{4x} - x + \frac{1}{4x} = \frac{1}{2x}$$

OR

Simplify :

$$\frac{\cot(90° - \theta)\tan\theta - \cos ec(90° - \theta)\sec\theta}{\sin 12° \cos 15° \sec 78° \cos ec 75°} + \frac{\cos^2(50° + \theta) + \cos^2(40° - \theta)}{\tan 15° \tan 37° \tan 53° \tan 75°}$$

Ans.

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

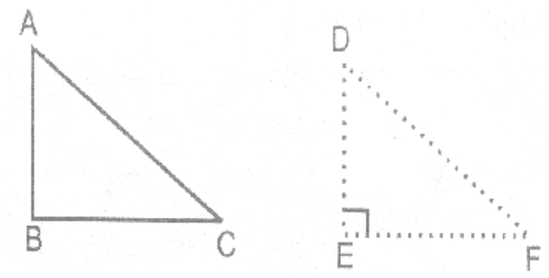
Given expression = For each conversion - ½

$$\frac{\tan^2\theta - \sec^2\theta}{\sin 12^\circ \cos 15^\circ \sec 15^\circ \operatorname{cosec} 12^\circ} + \frac{\sin^2(40^\circ - \theta) + \cos^2(40^\circ - \theta)}{\tan 15^\circ \tan 37^\circ \cot 37^\circ \cot 15^\circ}$$

For using the identity

$$= \frac{-1}{1} + \frac{1}{1} = 0$$ For final answer

Q.31 In a triangle, if the square of one side is equal to the sum of the squares of the other two sides, then the angle opposite to the first side is a right angle. Prove it . **Given :** A triangle ABC such that $AC^2 = AB^2 + BC^2$



Construction : Construct a triangle DEF such that DE = AB, EF = BC and $\angle E = 90^0$

Proof : In order to prove that $\angle B = 90.^0$, it is sufficient to show Δ ABC ~ Δ DEF. For this we proceed as follows Since Δ DEF is a right - angled triangle with right angle at E. Therefore, by Pythagoras theorem, we have

$DF^2 = DE^2 + EF^2$

$\Rightarrow DF^2 = AB^2 + BC^2$ [∴ DE = AB and EF = BC (By construction)]

$\Rightarrow DF^2 3 = AC^2$ [∴ $AB^2 + BC^2 = AC^2$ (Given)]

$\Rightarrow$ DF = AC .....(i)

Thus, in Δ ABC and Δ DEF, we have

AB = DE, BC = EF [By construction]

And AC = DF [From equation (i)]

∴ΔABC ≅ Δ DEF [By SSS criteria of congruency]

$\Rightarrow \angle B = \angle E = 90^0$

Hence, ΔABC is a right triangle, right angled at B.

Q.32 If α, β are the zeroes of the quadratic polynomial $x^2 - 6x + a$ then find the value of 'a' if $3\alpha + 2\beta = 20$.

ans :

$p(x) = x^2 - 6x + a$

$\alpha + \beta = \frac{-b}{a} = \frac{6}{1}$ --- (1)

$3\alpha + 2\beta = 20$ --- (ii)

(i) × 3

$3\alpha + 3\beta = 18$ --- (iii)

Solving $\beta = -2, \alpha = 8$

$\alpha\beta = a$

$(-2) \times 8 = a$

$\Rightarrow a = -16$

OR

If two zeroes of the polynomial p(x)=

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)

$x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find the other zeroes. **ANS :**

Sum = 4 Product = 1
⇒ Polynomial of is $x^2 - 4x + 1$

$(x^4 - 6x^3 - 26x^2 + 138x - 35) \div (x^2 - 4x + 1)$
$= x^2 - 2x - 35$
$= (x - 7)(x + 5)$
⇒ zeroes are $7, -5$

Q.33 Find the mean of the following data using step up deviation method .

C.I	25-30	30-35	35-40	40-45	45-50	50-55	55-60
f	14	22	16	6	5	3	4

class	x_i	f_i	$d_i = x_i - a$	$u_i = \frac{x_i - a}{h}$	$f_i u_i$
25 - 30	27.5	14	− 15	− 3	− 42
30 - 35	32.5	22	− 10	− 2	− 44
35 - 40	37.5	16	− 5	− 1	− 16
40 - 45	42.5 = a	6	0	0	0
45 - 50	47.5	5	5	1	5
50 - 55	52.5	3	10	2	6
55 - 60	57.5	4	15	3	12
		$\Sigma f_i = 70$			$\Sigma f_i u_i = -79$

$a = 42.5, h = 5$

$\bar{x} = a + h \frac{\Sigma f_i u_i}{\Sigma f_i}$

$= 42.5 + 5 \times \frac{(-79)}{70}$

$= 36.86$

Q.34 Prove that:

$(\sin\theta + \sec\theta)^2 + (\cos\theta + \cos ec\,\theta)^2 = (1 + \sec\theta \cos ec\,\theta)^2$. **A**

Consider $(\sin\theta + \sec\theta)^2 + (\cos\theta + \text{cosec}\,\theta)^2$

$= \sin^2\theta + \sec^2\theta + 2\tan\theta + \cos^2\theta + \text{cosec}^2\theta + 2\cot\theta$

$= 1 + \frac{\cos^2\theta + \sin^2\theta}{\sin^2\theta \cos^2\theta} + 2\left[\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}\right]$

$= 1 + \sec^2\theta\, \text{cosec}^2\theta + 2\sec\theta\, \text{cosec}\,\theta$

NS: $= (1 + \sec\theta\, \text{cosec}\,\theta)^2$

****

HAPPINESS IS NOTHING MORE THAN GOOD HEALTH AND A BAD MEMORY.

Target Mathematics by- Agyat Gupta ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601; 9425110860;9425772164(P)