

**BOARD OF INTERMEDIATE AND SECONDARY EDUCATION,
MULTAN**

OBJECTIVE KEY FOR INTER (PART-I/II) Annual Examination, 2016

Name of Subject Mathematics
Group: 1st

Session 2016 (A)
Group: 2nd

Q. Nos.	Paper Code	Paper Code	Paper Code	Paper Code
	8191	8193	8195	8197
1.	C	C	A	A
2.	A	B	A	F.C
3.	A	B	A	A
4.	C	B	B	C
5.	B	A	B	A
6.	C	A	A	C
7.	B	A	F.C	A
8.	B	A	A	A
9.	B	B	C	C
10.	A	B	A	B
11.	A	A	C	C
12.	A	F.C	A	B
13.	A	A	A	B
14.	B	C	C	B
15.	B	A	B	A
16.	A	C	C	A
17.	F.C	A	B	A
18.	A	A	B	A
19.	C	C	B	B
20.	A	B	A	B

Q. Nos.	Paper Code	Paper Code	Paper Code	Paper Code
	8192	8194	8196	8198
1.	B	C	B	A
2.	A	C	A	D
3.	A	B	A	A
4.	B	C	B	C
5.	B	B	A	A
6.	A	B	C	B
7.	D	A	C	A
8.	A	A	B	A
9.	C	B	C	B
10.	A	B	B	A
11.	B	A	B	C
12.	A	D	A	C
13.	A	A	A	B
14.	B	C	B	C
15.	A	A	B	B
16.	C	B	A	B
17.	C	A	D	A
18.	B	A	A	A
19.		B	C	B
20.	B	A	A	B

سرٹیفکیٹ بابت توضیح سوالیہ پرچہ مارکنگ Key

ہم نے مضمون ریاضی پرچہ II گروپ کے امتحان سے انٹرمیڈیٹ امتحان 2016ء کا سوالیہ پرچہ انتہائی اہم و مفید (Subjective & Objective) کو مدنظر میں چیک کر لیا ہے یہ پرچہ سلیبس کے میں مطابق Set کیا گیا ہے اس سوالیہ پرچہ میں کسی قسم کی کوئی غلطی نہ ہے۔ ہم نے سوالیہ پرچہ کا اردو اور انگریزی Version بھی چیک کر لیا ہے یہ Version آپس میں مطابقت رکھتے ہیں اور سلیبس (Syllabus) کے مطابق بھی ہیں۔ نیز اس پرچہ کی Key کی بابت بھی تصدیق کی جاتی ہے کہ یہ بھی درست بنائی گئی ہے۔ اس میں بھی کسی قسم کی کوئی غلطی نہ ہے۔ مزید یہ کہ ہم نے Key بنانے سے متعلق دفتر کی جانب سے تیار کردہ ہدایات وصول کر کے ان کا بغور مطالعہ کر لیا ہے اور ان کی روشنی میں Key بنائی ہے۔

PREPARED & CHECKED BY

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MATHEMATICS PAPER-II
GROUP-I

OBJECTIVE

TIME ALLOWED: 30 Minutes
MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) If $f(x) = x^{\frac{2}{3}} + 6$ then $f(0) =$ (A) 1 (B) 4 (C) 6 (D) 8
- (2) $\lim_{x \rightarrow 0} \frac{\sin ax}{\sin bx} =$ (A) $\frac{a}{b}$ (B) $\frac{-b}{a}$ (C) $\frac{-a}{b}$ (D) $\frac{b}{a}$
- (3) $\frac{d}{dx}(\cos x^2) =$ (A) $-2x \sin x^2$ (B) $2x \cos x^2$ (C) $x^2 \cos x^2$ (D) $-x^2 \cos x^2$
- (4) $\frac{d}{dx}(\sec x) =$ (A) $\sec x$ (B) $\operatorname{cosec} x$ (C) $\sec x \tan x$ (D) $-\sec x \tan x$
- (5) $\frac{d}{dx}(2^x) =$ (A) 2^x (B) $2^x \ln 2$ (C) $\frac{1}{2}x$ (D) $\frac{1}{2^x \log 2}$
- (6) $\frac{d}{dx}(\cosh^{-1} x) =$ (A) $\frac{1}{\sqrt{1+x^2}}$ (B) $\frac{1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{x^2-1}}$ (D) $\frac{-1}{\sqrt{x^2-1}}$
- (7) $\frac{d}{dx}(\cot^{-1} x) =$ (A) $\frac{1}{1+x^2}$ (B) $\frac{-1}{1+x^2}$ (C) $\frac{1}{1-x^2}$ (D) $\frac{-1}{1-x^2}$
- (8) $\int e^x \left(\frac{1}{x\sqrt{x^2-1}} + \sec^{-1} x \right) dx =$ (A) $\frac{e^x}{x\sqrt{x^2-1}}$ (B) $e^x \sec^{-1} x$ (C) $e^x \operatorname{cosec}^{-1} x$ (D) $e^x \cot^{-1} x$
- (9) $\int \sin^3 x \cos x dx =$ (A) $\frac{\sin^3 x}{3}$ (B) $\frac{\sin^4 x}{4}$ (C) $\frac{\sin^5 x}{5}$ (D) $\frac{\cos^4 x}{-4}$
- (10) $\int \frac{e^{\sec^{-1} x}}{x\sqrt{x^2-1}} dx$ is:- (A) $e^{\sec^{-1} x}$ (B) $e^{\operatorname{cosec}^{-1} x}$ (C) $e^{\tan^{-1} x}$ (D) $e^{\cot^{-1} x}$
- (11) $\int_{-\pi}^{\pi} \sin x dx =$ (A) 0 (B) 4 (C) 8 (D) 16
- (12) $\int \sin ax dx =$ (A) $\frac{-\cos ax}{a}$ (B) $\cos ax$ (C) $a \operatorname{cosec} ax$ (D) $a \sec ax$
- (13) Equation of vertical line through (5, -3) is:- (A) $x = 5$ (B) $y = -3$ (C) $y = 5$ (D) $x = -3$
- (14) $\frac{x}{a} + \frac{y}{b} = 1$ is:-
(A) Slope intercept form (B) Two intercept form (C) Symmetric form (D) Normal form
- (15) Slope of line perpendicular to $3x - 4y + 5 = 0$ is:- (A) $\frac{-3}{4}$ (B) $\frac{-4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{4}{3}$
- (16) Solution of $x < \frac{-3}{2}$ is:- (A) $\left(-\infty, \frac{-3}{2}\right)$ (B) $\left(\frac{-3}{2}, \infty\right)$ (C) $\left(\frac{-3}{2}, \frac{3}{2}\right)$ (D) $(-\infty, \infty)$
- (17) Standard equation of circle of radius r is:-
(A) $x^2 - y^2 = r^2$ (B) $x^2 + y^2 = r^2$ (C) $y^2 - x^2 = r^2$ (D) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
- (18) Focus of $y^2 = 4ax$ is:- (A) $(a, 0)$ (B) $(-a, 0)$ (C) $(0, a)$ (D) $(0, -a)$
- (19) Magnitude of $2\hat{i} - 3\hat{j} + \hat{k}$ is:- (A) $\sqrt{16}$ (B) $\sqrt{15}$ (C) $\sqrt{14}$ (D) $\sqrt{13}$
- (20) Projection of \underline{a} along \underline{b} is:- (A) $\underline{a} \cdot \underline{b}$ (B) $\hat{a} \cdot \underline{b}$ (C) $\hat{a} \cdot \hat{b}$ (D) $\underline{a} \cdot \hat{b}$

MATHEMATICS PAPER-II
GROUP-II

TIME ALLOWED: 30 Minutes

MAXIMUM MARKS: 20

OBJECTIVE

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) $\int \frac{\cot x}{\ln(\sin x)} dx$ (A) $\ln(\sin x)$ (B) $\ln[\ln(\sin x)]$ (C) $\ln(\cot x)$ (D) $\ln(\tan x)$
- (2) $\int e^{\sin x} \cos x dx$ (A) $e^{\sin x}$ (B) $e^{\cos x}$ (C) $e^{\tan x}$ (D) $e^{\cot x}$
- (3) If a line passes through $A(x_1, y_1)$ and $B(x_2, y_2)$. Then its slope is:-
 (A) $\frac{y_2 - y_1}{x_2 - x_1}$ (B) $-\frac{y_2 - y_1}{x_2 - x_1}$ (C) $\frac{x_2 - x_1}{y_2 - y_1}$ (D) $-\frac{x_2 - x_1}{y_2 - y_1}$
- (4) Equation of line through (1, 3) having slope 2 is:-
 (A) $x - 1 = 2(y - 3)$ (B) $y - 3 = 2(x - 1)$ (C) $y - 1 = 2(x - 3)$ (D) $x - 1 = 2(y - 3)$
- (5) Perpendicular distance from (0, 0) to line $5x + 12y - 7 = 0$ is:-
 (A) $\frac{7}{13}$ (B) $\frac{1}{13}$ (C) $\frac{13}{7}$ (D) 13
- (6) $x = -1$ is solution of:- (A) $x + 4 < 0$ (B) $2x + 3 < 0$ (C) $x + 4 > 0$ (D) $x > 0$
- (7) If centre is (0, 0) and radius is 3. Then equation of circle is:-
 (A) $x^2 + y^2 = 3$ (B) $x^2 + y^2 = 5$ (C) $x^2 + y^2 = 9$ (D) $x^2 + y^2 = 11$
- (8) Equation of tangent to $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ at point $P(x_1, y_1)$ is:-
 (A) $\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 1$ (B) $\frac{xx_1}{a^2} + \frac{yy_1}{b^2} = 1$ (C) $xx_1 - yy_1 = 0$ (D) $xx_1 + yy_1 = 0$
- (9) Unit vector perpendicular to \underline{a} and \underline{b} is:-
 (A) $\frac{\underline{a} \times \underline{b}}{|\underline{a}| \cdot |\underline{b}|}$ (B) $\frac{|\underline{a} \times \underline{b}|}{|\underline{a}| \cdot |\underline{b}|}$ (C) $\frac{\underline{a} \times \underline{b}}{|\underline{a} \times \underline{b}|}$ (D) $|\underline{a} \times \underline{b}|$
- (10) \underline{a} and \underline{b} are perpendicular if:- (A) $\underline{a} \times \underline{b} = 0$ (B) $\underline{a} \cdot \underline{b} = 0$ (C) $\underline{a} = \underline{b}$ (D) $\underline{a} = -\underline{b}$
- (11) Domain of $f(x) = \sqrt{x+1}$ is:- (A) $(-\infty, \infty)$ (B) $[-1, \infty)$ (C) $[0, \infty)$ (D) $[-1, 1]$
- (12) $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} =$ (A) 1 (B) 2 (C) 3 (D) 4
- (13) If $f(x) = \sin x$ then $f'(0) =$ (A) 1 (B) 2 (C) -1 (D) -2
- (14) $\frac{d}{dx}(\tanh x) =$ (A) $-\operatorname{sech}^2 x$ (B) $\operatorname{sech}^2 x$ (C) $\operatorname{cosec} h x$ (D) $-\operatorname{cosec} h^2 x$
- (15) $\frac{d}{dx}[\log_{10}(x+1)] =$ (A) $\frac{1}{x+1}$ (B) $\frac{1}{(x+1)\ln 10}$ (C) $\frac{-1}{x+1}$ (D) $\frac{-1}{(x+1)\ln 10}$
- (16) $\frac{d}{dx}(\sin^3 x) =$ (A) $3\sin^2 x \cos x$ (B) $2\sin^2 x \cos x$ (C) $\sec x$ (D) $\operatorname{cosec} x$
- (17) $f(x) = 3x^2$ has minimum value at:- (A) $x = 3$ (B) $x = 2$ (C) $x = 1$ (D) $x = 0$
- (18) $\int \frac{f'(x)}{f(x)} dx =$
 (A) $\ln[f(x)]$ (B) $f(x) \ln[f(x)]$ (C) $-\ln[f(x)]$ (D) $-f(x) \ln[f(x)]$
- (19) $\int \sec 5x \tan 5x dx =$ (A) $\sec 5x$ (B) $\frac{\sec 5x}{x}$ (C) $\frac{\sec 5x}{5}$ (D) $\frac{\sec 5x}{5x}$
- (20) $\int (x^2 + 2x - 1)^3 (2x + 2) dx =$
 (A) $\frac{(x^2 + 2x - 1)^4}{4}$ (B) $\frac{(x^2 + 2x - 1)^5}{5}$ (C) $\frac{(x^2 + 2x - 1)^3}{3}$ (D) $\frac{(x^2 + 2x - 1)^6}{6}$

NOTE: - Write same question number and its part number on answer book,
as given in the question paper.

SECTION-I $8 \times 2 = 16$

2. Attempt any eight parts.

(i) Define Even and Odd functions.

(ii) Evaluate $\lim_{x \rightarrow 0} \frac{x}{\tan x}$ (iii) Find $\frac{dy}{dx}$ where $y = x^2 \sec 4x$ (iv) Find $\frac{dy}{dx}$ if $x = y \sin y$ (v) Discuss the continuity of the function $f(x) = \begin{cases} \frac{x^2 - 9}{x - 3} & ; x \neq 3 \\ 6 & ; x = 3 \end{cases}$ at $x = 3$ (vi) If $y = \ln(x + \sqrt{x^2 + 1})$; find $\frac{dy}{dx}$ (vii) Differentiate $\sin^3 x$ w.r.t. $\cos^2 x$ (viii) Find $\frac{dy}{dx}$ if $y = \ln(9 - x^2)$ (ix) If $y = e^{-2x} \sin 2x$ then find $\frac{dy}{dx}$ (x) Find $\frac{dy}{dx}$ for $xy + y^2 = 2$ (xi) Differentiate $x^4 + 2x^3 + x^2$ w.r.t. x (xii) Find $\frac{dy}{dx}$ when $y = \sqrt{x} - \frac{1}{\sqrt{x}}$ $8 \times 2 = 16$

3. Attempt any eight parts.

(i) Find δy if $y = x^2 - 1$ and x changes from 3 to 3.02.(ii) Evaluate $\int x(\sqrt{x} + 1) dx$ (iii) Compute $\int \sin^2 x dx$ (iv) Evaluate $\int \frac{1}{(1+x^2)\tan^{-1}x} dx$ (v) Find $\int x \cos x dx$ (vi) Compute $\int e^x (\sin x + \cos x) dx$ (vii) Compute $\int_{-1}^1 (x^{1/3} + 1) dx$ (viii) Evaluate $\int_{\pi/6}^{\pi/3} \cos t dt$ (ix) Find the area between X -axis and the curve $y = x^2 + 1$ from $x = 1$ to $x = 2$ (x) Solve the differential equation $(x - 1) dx + y dy = 0$

(xi) Define Feasible Region.

(xii) Graph the solution region of $5x - 4y \leq 20$

INTERMEDIATE PART-II (12th CLASS)MATHEMATICS PAPER-II
GROUP-II

TIME ALLOWED: 2.30 Hours

MAXIMUM MARKS: 80

SUBJECTIVE

NOTE: - Write same question number and its part number on answer book,
as given in the question paper.

SECTION-I

2. Attempt any eight parts.

8 × 2 = 16

(i) Prove that $\sinh 2x = 2 \sinh x \cosh x$

(ii) Evaluate $\lim_{x \rightarrow 0} (1 + 3x)^{1/x}$

(iii) Define continuity of a function at point $x = a$ (iv) Differentiate $\frac{1}{\sqrt{x}}$ w.r.t x by definition.

(v) If $y = \frac{x^2 + 1}{x^2 - 3}$, then find $\frac{dy}{dx}$

(vi) If $x^2 + y^2 - 4x = 5$, then find $\frac{dy}{dx}$

(vii) Differentiate $\cos^{-1} x$ w.r.t x

(viii) Find $f'(x)$ when $f(x) = x^3 e^{1/x}$

(ix) If $y = \sinh^{-1}\left(\frac{x}{2}\right)$, find $\frac{dy}{dx}$

(x) Find y_2 when $y = \ln(x - 9)$

(xi) Write first two terms in the Maclaurin series for the expansion of a^x .

(xii) Find critical values of $f(x) = 5 + 3x - x^2$

8 × 2 = 16

3. Attempt any eight parts.

(i) Find δy and dy when $y = x^2 - 1$ and x changes from 3 to 3.02.

(ii) Evaluate $\int \sin^2 x dx$

(iii) Evaluate $\int \frac{\sqrt{y}(y+1)}{y} dy$

(iv) Find $\int a^{x^2} \cdot x dx$

(v) Evaluate $\int \frac{1}{x \ln x} dx$

(vi) Evaluate $\int e^{-x} (\cos x - \sin x) dx$

(vii) Evaluate $\int_{\pi/4}^{\pi/2} \cos t dt$

(viii) Evaluate $\int_{-1}^2 \sqrt{3-x} dx$

(ix) Evaluate $\int_{\pi/4}^{\pi/2} \cos^2 \theta \sin \theta d\theta$

(x) Solve the differential equation $x \frac{dy}{dx} = 1 + y$

(xi) Graph the feasible region of system of linear inequalities $x + y \leq 5$, $-2x + y \geq 2$, $x \geq 0$

(xii) What is an Objective Function?

P.T.O.

4. Attempt any nine parts.

- (i) Find k so that the line joining $A(7, 3)$, $B(k, -6)$ and the line joining $C(-4, 5)$, $D(-6, 4)$ are parallel.
- (ii) Find an equation of the line through $(-5, -3)$ and $(9, -1)$
- (iii) Find an equation of the line through $(-4, -6)$ and perpendicular to a line having slope $\frac{-3}{2}$
- (iv) Find the lines represented by the homogeneous equation $10x^2 - 23xy - 5y^2 = 0$
- (v) Check whether the point $(-2, 4)$ lies above or below the line $4x + 5y - 3 = 0$
- (vi) Find centre and radius of the circle $x^2 + y^2 - 6x + 4y + 13 = 0$
- (vii) Determine whether the point $P(-5, 6)$ lies outside, on or inside the circle $x^2 + y^2 + 4x - 6y - 12 = 0$
- (viii) Find focus and vertex of the parabola $y^2 = -12x$
- (ix) Find centre and foci of ellipse $9x^2 + y^2 = 18$
- (x) If $\vec{v} = 3\vec{i} - 2\vec{j} + 2\vec{k}$, $\vec{w} = 5\vec{i} - \vec{j} + 3\vec{k}$, find $|3\vec{v} + \vec{w}|$
- (xi) Find cosine of angle between the vectors $u = 2\vec{i} - \vec{j} + \vec{k}$ and $\vec{v} = -\vec{i} + \vec{j}$
- (xii) Find the volume of the parallelepiped determined by $\vec{u} = \vec{i} + 2\vec{j} - \vec{k}$, $\vec{v} = \vec{i} - 2\vec{j} + 3\vec{k}$, $\vec{w} = \vec{i} - 7\vec{j} - 4\vec{k}$
- (xiii) If $\vec{a} = 4\vec{i} + 3\vec{j} + \vec{k}$ and $\vec{b} = 2\vec{i} - \vec{j} + 2\vec{k}$. Find a unit vector perpendicular to both \vec{a} and \vec{b} .

SECTION-II

NOTE: - Attempt any three questions.

3 × 10 = 30

5.(a) Evaluate $\lim_{\theta \rightarrow 0} \frac{\tan \theta - \sin \theta}{\sin^3 \theta}$

(b) If $x = \frac{1-t^2}{1+t^2}$, $y = \frac{2t}{1+t^2}$ then prove that $y \frac{dy}{dx} + x = 0$

6.(a) Evaluate $\int \frac{x}{x^4 + 2x^2 + 5} dx$

(b) Show that distance of the point $P(x_1, y_1)$ from the line $ax + by + c = 0$ is $\frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$

7. (a) Evaluate $\int_0^{\pi/4} \frac{\cos \theta + \sin \theta}{2\cos^2 \theta} d\theta$

(b) Minimize $f(x, y) = 3x + y$ subject to constraints $3x + 5y \geq 15$, $x + 6y \geq 9$, $x \geq 0$; $y \geq 0$

8. (a) Show that the circles $x^2 + y^2 + 2x - 2y - 7 = 0$ and $x^2 + y^2 - 6x + 4y + 9 = 0$ touch externally.

(b) Prove that the line segments joining the mid points of the sides of a quadrilateral taken in order form a parallelogram using Vector Method.

9.(a) Find the focus, vertex and directrix of the parabola $y = 6x^2 - 1$

(b) Find the moment about $A(1, 1, 1)$ of each of the concurrent forces $\vec{i} - 2\vec{j}$, $3\vec{i} + 2\vec{j} - \vec{k}$, $5\vec{j} + 2\vec{k}$ where $P(2, 0, 1)$ is their point of concurrency.

4. Attempt any nine parts.

- (i) Find area of triangle with vertices $A(1, 4)$, $B(2, -3)$, $C(3, -10)$
- (ii) Find equation of perpendicular bisector of segment joining $A(3, 5)$, $B(9, 8)$
- (iii) Find h such that $A(h, 1)$, $B(2, 7)$, $C(-6, -7)$ are vertices of a right triangle with right angle at A
- (iv) Check whether lines $x - 2y - 6 = 0$, $3x - y + 3 = 0$, $2x + y - 4 = 0$ are concurrent.
- (v) Convert $15y - 8x + 3 = 0$ into normal form.
- (vi) Find equation of a circle with centre $(\sqrt{2}, -3\sqrt{3})$ and radius $2\sqrt{2}$
- (vii) Find length of tangent from $P(-5, 10)$ to circle $5x^2 + 5y^2 + 14x + 12y - 10 = 0$
- (viii) Find equation of parabola with focus $(-3, 1)$, directrix $x = 3$.
- (ix) Find foci and eccentricity of ellipse $9x^2 + y^2 = 18$
- (x) Find $A(x, y)$ if $\overline{AB} = \overline{CD}$ given that $B = (1, 2)$, $C = (-2, 5)$, $D = (4, 11)$
- (xi) Find direction cosine of $6i - 2j + k$.
- (xii) Find angle between vectors $\underline{u} = 2i - j + k$ and $\underline{v} = -i + j$
- (xiii) Prove that vectors $i - 2j + 3k$, $-2i + 3j - 4k$ and $i - 3j + 5k$ are coplanar.

SECTION-II

NOTE: - Attempt any three questions.

3 × 10 = 30

- 5.(a) If $f(x) = \begin{cases} \frac{\sqrt{2x+5} - \sqrt{x+7}}{x-2} & , x \neq 2 \\ k & \text{if } x = 2 \end{cases}$ Find value of k , so that f is continuous at $x = 2$
- (b) If $y = a \cos(\ell nx) + b \sin(\ell nx)$ prove that $x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} + y = 0$
- 6.(a) Evaluate $\int \tan^3 x \sec x \, dx$
- (b) The vertices of a triangle are $A(-2, 3)$, $B(-4, 1)$ and $C(3, 5)$. Find coordinates of orthocentre.
7. (a) Solve the differential equation $(x^2 - yx^2) \frac{dy}{dx} + y^2 + xy^2 = 0$
- (b) Maximize $f(x, y) = x + 3y$ subject to the constraints $2x + 5y \leq 30$, $5x + 4y \leq 20$
 $x \geq 0$, $y \geq 0$
8. (a) Write an equation of circle which passes through the points $A(4, 5)$, $B(-4, -3)$, $C(8, -3)$
- (b) Find the vector from the point A to the origin when $\overline{AB} = 4\vec{i} - 2\vec{j}$ and B is the point $(-2, 5)$
- 9.(a) Find equation of parabola with given elements, focus $(-3, 1)$ and directrix $x - 2y - 3 = 0$
- (b) In any triangle ABC , prove that by vector method $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$