Students are to answer 30 questions. The breakdown is as shown below.

Time allowed 1h: 30mins

Section 1------- 3 questions

Section 2------- 3 questions

Section 3------- 2 questions

Section 4------- 2 questions

Section 5------- 2 questions

Section 6------- 2 questions

Section 7------- 2 questions

Section 8------- 2 questions

Section 9------- 2 questions

Section 10------- 2 questions

Section 11------- 1 question

Section 12------- 1 question

Section 13------- 1 question

Section 14------- 2 questions

Section 15------- 1 question

Section 16------- 1 question

Section 17------- 1 question

SECTION 1

^^ When two conjoined cones at the apex are dissected vertically parallel to the vertical height, the resulting cross-sectional shape is that of a/an

@@ Ellipse
@@ Circle
@@ Parabola
@@ Hyperbola ~
^^ When a cone is dissected parallel to the slanting side, the resulting cross-sectional shape is that of a/an
@@ Ellipse
@@ Circle
@@ Parabola ~
@@ Hyperbola
^^ When a cone is dissected at an orientation that is neither parallel to the slanting side nor the circular base, the resulting cross-sectional shape is that of a/an
@@ Ellipse ~
@@ Circle
@@ Parabola
@@ Hyperbola

^^ When a cone is dissected parallel to the circular base, the resulting cross-sectional shape is that of
@@ Ellipse
@@ Circle ~
@@ Parabola
@@ Hyperbola
^^ The coordinate of the focus of the curve represented by $y = 3t + 1$ and $x = t^2 - 2$ is
@@ $\left(\frac{1}{4}, 1\right)$ ~
@@ $\left(\frac{13}{4}, 1\right)$
@@ $\left(\frac{5}{4}, -1\right)$
@@ $\left(-\frac{13}{4}, -1\right)$
^^ The coordinate of the focus of the curve represented by $y = 4t + 1$ and $x = t^2 - 2$ is
@@ $(2, 1)$ ~
@@ $(4, 1)$
@@ $(-2, -1)$
@@ $(4, -1)$
^^ The focus of the Parabola $(y - 1)^2 = 8(x - 2)$ is located at
@@ (4, 1) ~
@@ (2, 1)

@@ (1, 2)

@@ (1, 4)

^^ _________ is the set of all points that satisfy a set of condition
@@ Directrix
@@ Focus
@@ Locus ~
@@ Vertex
^^ The parabola whose vertex is at (2, 1) and focus 2units way from the vertex having its axis of symmetry parallel to the X-axis is
@@ $(y-1)^2 = 12(x-2)$
@@ $(x+2)^2 = 8(y+1)$
@@ $(x-2)^2 = 12(y-1)$
@@ $(y-1)^2 = 8(x-2)$ ~
^^ At both ends of the Lactus Rectum to the Parabola $y^2 = 4ax$, tangents are drawn. The two tangents meet
@@ on the directrix ~
@@ at the vertex
@@ at the focus
@@ on the normal
^^ The Parabola $y^2 - 2y = 4x + 3$ has its focus at
@@ $(-1, -1)$
@@ $(1, 1)$
@@ $(-1, 1)$
@@ $(0, 1)$ ~
^^ An ellipse with center at the origin has eccentricity $\frac{1}{2}$. If the distance between both vertices is 8, what is the distance between a focus and its corresponding directrix?
@@ 8
@@ 6 ~
@@ 4
@@ 5
^^ One focus of the ellipse $\frac{x^2}{16} + \frac{y^2}{4} = 1$ is at
@@ $(2\sqrt{3}, -2\sqrt{3})$
@@ $(2\sqrt{3}, 0)$ ~
@@ $(0 \ -2\sqrt{3})$
@@ $(0, -2\sqrt{3})$

^^ If the ellipse $\frac{x^2}{16} + \frac{y^2}{4} = 1$ has a focus at S and the corresponding vertex at Q. What is the coordinates of P; the mid-point of the line segment SQ

@@ $(3 + \sqrt{2}, 0)$
@@ $(3\sqrt{2}, 0)$
@@ $(2 + \sqrt{3}, 0)$ ~

@@ $(2\sqrt{3}, \ 0)$
^^ A parabola is the only conic that has
@@ a unity eccentricity ~
@@ focus
@@ vertix
@@ line of symmetry
^^ The center of a hyperbola is at the origin and one vertex is at $(4,0)$. If the line $x = 2$ is a directrix, what is the coordinates of a focus of the hyperbola
@@ (4, 0)
@@ (2, 0)
@@ (4, 2)
@@ (8, 0) ~
^^ The center of a hyperbola is at the origin and one vertex is at $(4,0)$. If the line $x = 2$ is a directrix, what is the distance between a focus and its associated vertex?
@@ 4 ~
@@ 8
@@ 6
@@ 2
^^ A hyperbola with center at (1, 1) and eccentricity $e = \frac{3}{2}$ has a focus at (10, 1). The coordinates of a vertex is?
@@ (1, 7)
@@ (1, 6)
@@ (7, 1) ~
@@ (6, 1)
^^ The following is/are true of rectangular hyperbolas with center at the origin
I $e^2 - 2 = 0$ II $e = \sqrt{2}$ III vertex at (a, a) IV focus at (ae, 0)
@@ I and IV only
@@ II, III and IV only
@@ All of the above
@@ I, II and IV only ~
^^ An ellipse with center at the origin has eccentricity $\frac{1}{2}$. If the distance between both vertices is 8, what is the distance between the two foci?
@@ 8
@@ 6
@@ 2
@@ 4 ~
^^ An ellipse has its foci at (6,0) and (- 6,0). If the length of its major axis is 14, the length of the minor axis is
@@ $2\sqrt{13}$ ~
@@ $3\sqrt{13}$
@@ $13\sqrt{2}$
@@ $2\sqrt{5}$
^^ An ellipse has its foci at (6,0) and (- 6,0). If the length of its major axis is 14, find its

equation

@@ $\frac{x^2}{7}+\frac{y^2}{13}=1$

@@ $\frac{x^2}{49}+\frac{y^2}{13}=1$ ~

@@ $\frac{x^2}{13}+\frac{y^2}{49}=1$

@@ $\frac{x^2}{14}+\frac{y^2}{13}=1$

^^ An ellipse has its foci at (6,0) and (- 6,0). If the length of its major axis is 14, the value of its eccentricity is

@@ $\frac{3}{4}$

@@ $\frac{5}{6}$

@@ $\frac{3}{5}$

@@ $\frac{6}{7}$ ~

^^ A given hyperbola has its center at the origin and one vertex at $(4,0)$. If the line $x=2$ is the corresponding directrix, what is the distance between the foci?

@@ 8

@@ 16 ~

@@ 10

@@ 12

^^ A given hyperbola has its center at the origin and one vertex at $(4,0)$. what is the distance between the vertexes?

@@ 8 ~

@@ 16

@@ 10

@@ 12

SECTION 2

^^ The eccentricity *(e)* of the ellipse $2(x^2+2y^2)-8y+8x=-4$ is

@@ $\sqrt{\frac{1}{2}}$ ~

@@ $\frac{1}{2}$

@@ 1

@@ 4

^^ If the length of the major axis and the eccentricity of an ellipse are 10 and $\frac{3}{5}$ respectively, find the length of the semi-minor axis
@@ 8
@@ 4 ~
@@ 16
@@ 2

^^ An ellipse with center at the origin has eccentricity $\frac{1}{2}$. If the distance between both vertices is 8, what is the length of Lactus Rectum?
@@ $2\sqrt{3}$
@@ 5
@@ 4
@@ 6 ~

^^ $y^2 = 8x$ and $y^2 = 32x$ are equations of two Parabolas with eccentricities e_1 and e_2 respectively. Which of the followings is/are true:

I $e_1 > e_2$ II $e_1 < e_2$ III $e_1 - e_2 = 0$ IV $e_1 + e_2 = 2$

@@ I only

@@ III and IV ~

@@ II only

@@ I and IV

^^ The range of eccentricity of the hyperbola is ________
@@ $1 < e < \infty$ ~
@@ $0 < e < 1$
@@ $0 < e < \infty$
@@ $\sqrt{2} < e < \infty$
^^ A conic with eccentricity $e = \sqrt{6}$ must be a/an_______
@@ Parabola
@@ Ellipse
@@ Rectangular hyperbola
@@ Hyperbola ~

^^ Which of the following is a true property of an eccentricity (e)
@@ $-\infty < e < 0$
@@ $0 \le e \le \infty$ ~
@@ $e = \sqrt{-1}$

@@ $e = -1$

^^ The eccentricity of a conic section is $\frac{1}{2}$, if the length of its major axis is 8, what is the length of its semi-minor axis

@@ $3\sqrt{2}$

@@ $4\sqrt{5}$

@@ $2\sqrt{3}$ ~

@@ 6

^^ An ellipse with center at the origin has eccentricity $\frac{1}{2}$. If the distance between both vertices is 8, what is the distance between the two directirces?

@@ 16 ~

@@ 14

@@ 12

@@ 10

^^ The semi Major axis and eccentricities of two ellipses are: $E_1\left(a = 4,\ e = \frac{1}{2}\right)$ and $E_2\left(a = 3,\ e = \frac{2}{3}\right)$. If they both share a common center at the origin, the distance between their foci is

@@ 1

@@ $\frac{1}{2}$

@@ $\frac{2}{3}$

@@ 0 ~

^^ The eccentricity of the curve represented by the equations $x + 1 = 5\cos\theta$ and $y - 2 = 4\sin\theta$ is

@@ $\frac{3}{5}$ ~

@@ $\frac{\sqrt{5}}{3}$

@@ $\frac{4}{9}$

@@ $\frac{9}{5}$

^^ The semi-Major axis and eccentricities of two ellipses are: $E_1\left(a = 4,\ e = \frac{1}{2}\right)$ and $E_2\left(a = 3,\ e = \frac{1}{3}\right)$. If they both share a common center at the origin, the distance between their directrices is

@@ 1 ~

@@ 3
@@ 4
@@ 4.5

^^ The semi Major axis and eccentricities of two ellipses are: $E_1\left(a=4,\ e=\frac{1}{2}\right)$ and $E_2\left(a=3,\ e=\frac{2}{3}\right)$. If they both share a common center at the origin, the absolute difference between their Major axes is
@@ 5
@@ 3
@@ 4
@@ 2 ~
^^ Let $x^2+4y^2-2x+4y-2=0$ be the equation of an ellipse. The value of the eccentricity of this ellipse is
@@ $\frac{3}{5}$
@@ $\frac{2}{3}$
@@ $\frac{4}{5}$ ~
@@ $\frac{2}{5}$
^^ The center of a hyperbola is at the origin and one vertex is at $(4,0)$. If the line $x=2$ is a directrix, what is the value of its eccentricity?
@@ 4
@@ 2 ~
@@ $\frac{1}{2}$
@@ $\frac{3}{2}$
^^ The eccentricity of a conic can be any of the following except
@@ -1 ~
@@ 0
@@ $\sqrt{2}$
@@ 0.5
^^ The eccentricity of the curve represented by the equations $x=3\cos\beta$ and $y=2\sin\beta$ is
@@ $\frac{\sqrt{3}}{5}$
@@ $\frac{\sqrt{5}}{3}$ ~
@@ $\frac{4}{9}$
@@ $\frac{9}{5}$

^^ The conic whose eccentricity is $\sqrt{2}$ must be a/an
@@ parabola
@@ ellipse
@@ rectangular hyperbola
@@ hyperbola ~
^^ The eccentricity of a rectangular hyperbola is
@@ $\sqrt{3}$
@@ $\sqrt{2}$ ~
@@ $\sqrt{5}$
@@ $\sqrt{7}$

SECTION 3

^^ The equation of normal to the parabola $3x^2 +6x -12y =0$ at P(2, 2) is __________
@@ 2y -3x +2 =0
@@ 2y +3x -10 =0
@@ 3y +2x -10 =0 ~
@@ 3y -2x -2 =0
^^ The equation of normal to the parabola $3x^2 +6x -12y =0$ at P(0, 1) is __________
@@ y +2x -1 =0 ~
@@ 2y +3x -10 =0
@@ 3y +2x -10 =0
@@ 3y -2x -2 =0
^^ The equation of normal to the parabola $3x^2 +6x -12y =0$ at P(0, -1) is
@@ y +2x +1 =0 ~
@@ 2y +3x -10 =0
@@ 3y +2x -10 =0
@@ 3y -2x -2 =0
^^ The equation of normal to the parabola $3x^2 +6x -12y =0$ at P(0, -2) is
@@ y +2x -2 =0 ~
@@ 2y +3x -10 =0
@@ 3y +2x -10 =0
@@ 3y -2x -2 =0
^^ The equation of Normal to the Parabola $x^2 -6x -8y +1 =0$ at the point $(1, -\frac{1}{2})$ is
@@ 2x +4y +5 =0
@@ 2x +y -5 =0
@@ 2y -4x +5 =0 ~
@@ 2y -x -5 =0
^^ The equation of Normal to the Parabola $x^2 -6x -8y +1 =0$ at the point (1,0) is
@@ 2x +4y +5 =0

@@ $2x + y - 5 = 0$
@@ $y - 2x + 2 = 0$ ~
@@ $2y - x - 5 = 0$
^^ The equation of Normal to the Parabola $x^2 - 6x - 8y + 1 = 0$ at the point (1, -1) is
@@ $2x + 4y + 5 = 0$
@@ $2x + y - 5 = 0$
@@ $y - 2x + 3 = 0$ ~
@@ $2y - x - 5 = 0$
^^ The equation of a normal to the parabola $y^2 = 4x$ at (0, 1) is given by
@@ $y - 2x = -1$
@@ $y + 2x = 1$
@@ $2y + x + 1 = 0$
@@ $2y - x = 2$ ~
^^ The equation of a normal to the parabola $y^2 = 4x$ at (1, 1) is given by
@@ $y - 2x = -1$
@@ $y + 2x = 1$
@@ $2y - 2x + 1 = 0$
@@ $y - 2x = -1$ ~
^^ The slope of the normal at any point on the rectangular hyperbola $x = ct$, $y = ct^{-1}$ is
@@ ct
@@ $-t^{-2}$
@@ t^2 ~
@@ $-ct$

^^ The equation of normal to the ellipse $x^2 + 5y^2 = 25$ at the point (1,2) is
@@ $y = x - 1$
@@ $y = 5x - 2$
@@ $y = 5x + 3$
@@ $y = 5x - 3$ ~
^^ The equation of normal to the curve $x^2 = 6y$ at the point (2, 1) is
@@ $2y + 3x - 8 = 0$ ~
@@ $2y + 3x + 8 = 0$
@@ $3y + 2x - 8 = 0$
@@ $2y - 3x - 8 = 0$
^^ The equation of normal to the curve $x^2 = 6y$ at the point (3, 1) is
@@ $2y + x - 5 = 0$ ~
@@ $2y + 3x + 5 = 0$
@@ $3y + 2x - 8 = 0$
@@ $2y - 3x - 8 = 0$
^^ The condition for the line $y = mx + k$ to be a tangent to the conics $b^2x^2 - a^2y^2 = a^2b^2$ is
@@ $k = \pm\sqrt{a^2m^2 - b^2}$ ~
@@ $k = \pm a/m$
@@ $k = \pm\sqrt{a^2m^2 + b^2}$
@@ $k = \pm\frac{a}{m}\sqrt{m^2 + 1}$

^^ The condition for the line $y = mx + k$ to be a tangent to the conics $y^2 = 4ax$ is
@@ $k = \pm\sqrt{a^2m^2 + b^2}$
@@ $k = {}^{a}/_{m}$ ~
@@ $k = {}^{m}/_{a}$
@@ $k = \pm\sqrt{a^2m^2 - b^2}$

SECTION 4

^^ At the point $(9, 6\sqrt{6})$ on the hyperbola $\frac{x^2}{9} - \frac{y^2}{16} = 1$, the equation of the tangent is
@@ $9x + 2\sqrt{6}\,y = 7$
@@ $3\sqrt{6}x + 2y = 4$
@@ $9x - 2\sqrt{6}\,y - 9 = 0$ ~
@@ $9x + 27y - 6\sqrt{6} = 0$
^^ Tangents at two points P(8,8) and Q(2,4) on the Parabola $x = 2t^2$, $y = 4t$ meet at *R*, the Coordinates of *R*
@@ (2, 1)
@@ (4, 6) ~
@@ (3, 2)
@@ (0, 0)
^^ Equation of tangent to the curve $3x^2 + 6x - 12y = 0$ at P(2, 2) is _________
@@ $2y - 3x + 2 = 0$ ~
@@ $3y + 2x - 10 = 0$
@@ $3y - 2x - 2 = 0$
@@ $2y + 3x - 10 = 0$
^^ Equation of tangent to the parabola $y^2 = 12x$ at (0, 1) is
@@ $2y + x = 1$
@@ $y - x = 2$
@@ $y - 6x = 1$
@@ $6y = x - 1$ ~
^^ A parabola has parametric equation $x = t^2$, $y = 2t$. What is the equation of its tangent if $t = 2$?
@@ $y + 2x + 4 = 0$
@@ $y - 2x + 4 = 0$
@@ $2y - x - 4 = 0$ ~
@@ $x - y - 4 = 0$
^^ The equation of tangent to the parabola $x^2 = 4(y + 1)$ at the point P(2 , -1)
@@ $y = x + 1$
@@ $y = x - 3$ ~
@@ $y = x - 1$
@@ $y = x + 3$

^^ The line tangent to the curve $y = \sqrt{16 - x}$ at the point (0, 4) has slope
@@ -8
@@ 4
@@ $-\frac{1}{8}$ ~
@@ 8
^^ Let $x^2 + 4y^2 - 2x + 4y - 2 = 0$ be the equation of an ellipse. The slope of the tangent to this ellipse at $\left(\frac{9}{5}, 4\right)$ is
@@ $\frac{4}{5}$
@@ $-\frac{5}{4}$ ~
@@ $-\frac{4}{5}$
@@ $\frac{5}{4}$

^^ Let $x^2 + 4y^2 - 2x + 4y - 2 = 0$ be the equation of an ellipse. Equation of the tangent to the ellipse at $\left(\frac{9}{5}, 4\right)$ is
@@ $5x + 4y = 25$ ~
@@ $4x + 5y = 9$
@@ $5x + 4y = 9$
@@ $4x + 5y = 25$

^^ The parametric equation of an ellipse is $x = 4\cos\theta$, $y = 3\sin\theta$. If $\theta = \frac{\pi}{3}$, equation of the tangent to this ellipse is
@@ $\frac{x}{3} + \frac{y\sqrt{3}}{4} = 1$
@@ $\frac{x}{4} + \frac{y\sqrt{3}}{3} = 1$
@@ $\frac{x}{8} + \frac{y\sqrt{3}}{6} = 1$ ~
@@ $\frac{x}{6} + \frac{y\sqrt{3}}{8} = 1$
^^ At what point on the graph of $y = \frac{1}{2}x^2$ is the tangent line parallel to the line $2x - 4y = 3$?
@@ $\left(\frac{1}{2}, \frac{1}{2}\right)$
@@ $\left(\frac{1}{2}, \frac{1}{8}\right)$ ~
@@ $\left(1, -\frac{1}{4}\right)$

@@ $\left(1, \frac{1}{2}\right)$

^^ The slope of the line tangent to the graph of $y = \ln\left(\frac{x}{2}\right)$ at $x = 6$ is:
@@ $\frac{1}{2}$
@@ $\frac{1}{4}$
@@ $\frac{1}{6}$ ~
@@ $\frac{1}{8}$

^^ An equation of the line tangent to $y = x^3 + 3x^2 + 2$ at its point of inflexion is
@@ $y = -6x - 6$
@@ $y = 2x + 10$
@@ $y = 3x - 1$
@@ $y = -3x + 1$ ~
^^ The line tangent to the curve $y = \sqrt{36 - x}$ at the point (0, 4) has slope
@@ -12
@@ 6
@@ $-\frac{1}{12}$~
@@ 12

^^ The condition for the line $y = mx + k$ to be a tangent to the conics
$b^2x^2 + a^2y^2 = a^2b^2$ is
@@ $k = \pm\sqrt{a^2m^2 + b^2}$ ~
@@ $k = \pm a/m$
@@ $k = \pm\sqrt{a^2m^2 - b^2}$
@@ $k = \pm\frac{a}{m}\sqrt{m^2 + 1}$
^^ The slope of the tangent at any point on the rectangular hyperbola $x = ct$, $y = ct^{-1}$ is
@@ ct
@@ $-t^{-2}$ ~
@@ t^2
@@ $-ct$
^^ The equation of tangent to the curve $2x^2 + y^2 - xy = 2$ at the point (1, 1) is
@@ $y + 3x - 4 = 0$ ~
@@ $3y + x + 4 = 0$
@@ $y - 3x - 4 = 0$
@@ $3x + y + 4 = 0$
^^ The equation of tangent to the curve $x^2 = 4y$ at the point (2, 1) is
@@ $y + x = 1$

@@ y -x = -3
@@ y -x = -1 ~
@@ x -y =3
^^ The line tangent to the curve y^2 =x +4 at the point (0, 2) is;
@@ 4y -x -2 =0
@@ 4y -x -8 =0 ~
@@ 4y +x -8 =0
@@ y -x -2 =0

SECTION 5

^^ The equation $10x^2$ $-10(y -2)^2$ -1 =0 represents a/an
@@ rectangular hyperbola ~
@@ parabola
@@ ellipse
@@ hyperbola
^^ The equation $2x^2$ $-4(y -2)^2$ -8 =0 represents a/an
@@ rectangular hyperbola
@@ parabola
@@ ellipse
@@ hyperbola ~
^^ The equation $4x^2$ $+12(y -2)^2$ -48 =0 represents a/an
@@ rectangular hyperbola
@@ parabola
@@ ellipse ~
@@ hyperbola
^^ The equation $4(x +7)^2$ $+12(y +2)^2$ -48 =0 represents a/an
@@ rectangular hyperbola
@@ parabola
@@ ellipse ~
@@ hyperbola
^^ The equation x $+3(y +2)^2$ -12 =0 represents a/an
@@ rectangular hyperbola
@@ parabola ~
@@ ellipse
@@ hyperbola
^^ The equation 12x $+(y +2)^2$ -6 =0 represents a/an
@@ rectangular hyperbola
@@ parabola ~
@@ ellipse
@@ hyperbola
^^ The equation x^2 $-(y +2)^2$ -16 =0 represents a/an

@@ rectangular hyperbola ~
@@ parabola
@@ ellipse
@@ hyperbola
^^ The equation $x^2 + y^2 - 16 = 0$ represents a/an
@@ rectangular hyperbola
@@ circle ~
@@ ellipse
@@ hyperbola
^^ The equation $x^2 + y^2 - 1 = 0$ represents a/an
@@ rectangular hyperbola
@@ circle ~
@@ ellipse
@@ hyperbola
^^ The equation $x^2 + y^2 - 36 = 0$ represents a/an
@@ rectangular hyperbola
@@ circle ~
@@ ellipse
@@ hyperbola

SECTION 6

^^ The values of x at the stationary points of the function $y = 4x^3 + 15x^2 - 18x + 7$ are
@@ $x = 1/2$ and $x = -3$ ~
@@ $x = 1/3$ and $x = 3$
@@ $x = 1/5$ and $x = 2$
@@ $x = 1/3$ and $x = -2$
^^ The values of x at the stationary points of the function $y = x^3 - 3x^2 + 3x + 2$ are
@@ $x = 1$ and $x = 1$ ~
@@ $x = -1$ and $x = 3$
@@ $x = 1$ and $x = 2$
@@ $x = -2$ and $x = 2$
^^ The values of x at the stationary points of the function $y = x^3 - 3x - 2$ are
@@ $x = 1$ and $x = -1$ ~
@@ $x = -1$ and $x = 3$
@@ $x = 1$ and $x = 2$
@@ $x = 1$ and $x = 1$
^^ The values of x at the stationary points of the function $y = 2x^3 + 3x^2 + 36x + 5$ are

@@ $x = -3$ and $x = 2$ ~
@@ $x = -1$ and $x = 3$
@@ $x = 1$ and $x = 2$
@@ $x = -2$ and $x = 2$
^^ The values of x at the stationary points of the function $y = 3x^3 - 2x^2 - 5x - 5$ are
@@ $x = 1$ and $x = -5/9$ ~
@@ $x = -1$ and $x = -4/9$
@@ $x = 1$ and $x = 5/9$
@@ $x = -2$ and $x = 2$
^^ The values of x at the stationary points of the function $y = x^3 - 3x^2 + 3x$ are
@@ $x = 1$ and $x = 1$ ~
@@ $x = -1$ and $x = 3$
@@ $x = 1$ and $x = 2$
@@ $x = -2$ and $x = 2$
^^ The values of x at the stationary points of the function $y = 2x^3 - 3x^2 - 12x + 1$ are
@@ $x = 2$ and $x = -1$ ~
@@ $x = -1$ and $x = 3$
@@ $x = 1$ and $x = 2$
@@ $x = -2$ and $x = 2$
^^ The values of x at the stationary points of the function $y = x^3 - 2x^2 + x + 4$ are
@@ $x = 1/3$ and $x = 1$ ~
@@ $x = -1$ and $x = 3$
@@ $x = 1/3$ and $x = 2$
@@ $x = -2$ and $x = 2$
^^ The values of x at the stationary points of the function $y = x^3 - 6x^2 + 9x + 1$ are
@@ $x = 3$ and $x = 1$ ~
@@ $x = -1$ and $x = 3$
@@ $x = 1/3$ and $x = 2$
@@ $x = -2$ and $x = 2$

SECTION 7

^^ Given that $y = x^3 - 6x^2 + 9x + 1$, the value of x at the inflexion point is $x = 5/6$
@@ True ~
@@ False
^^ Given that $y = x^3 - 6x^2 + 9x + 1$, the value of x at the inflexion point is $x = 6/5$
@@ True
@@ False ~

^^ At a local minimum, $\frac{dy}{dx}$ changes from positive to negative as x increases
@@ True
@@ False ~
^^ At a local maximum, $\frac{dy}{dx}$ changes from positive to negative as x increases
@@ True ~
@@ False
^^ At a local minimum, $\frac{dy}{dx}$ changes from negative to positive as x increases
@@ True ~
@@ False
^^ At a local maximum, $\frac{dy}{dx}$ changes from negative to positive as x increases
@@ True
@@ False ~
^^ At the point of inflexion of the function y, $\frac{d^2y}{dx^2} > 0$
@@ True
@@ False ~
^^ At the point of inflexion of the function y, $\frac{d^2y}{dx^2} < 0$
@@ True
@@ False ~
^^ At the point of inflexion of the function y, $\frac{d^2y}{dx^2} = 0$
@@ True ~
@@ False
^^ The function $y = 2x^3 - 5x^2 - 4x + 1$ is minimum at $x = 2$
@@ True ~
@@ False
^^ At a minimum point of the function y, $\frac{d^2y}{dx^2} < 0$
@@ True
@@ False ~
^^ The function $y = 2x^3 - 5x^2 - 4x + 1$ is maximum at $x = 2$
@@ True
@@ False ~
^^ The function $y = x^3 - 2x^2 + x + 3$ is maximum at $x = 1$
@@ True
@@ False ~
^^ The function $y = 2x^3 - 2x^2 + x + 3$ is maximum at $x = {}^1\!/_3$
@@ True ~

@@ False

^^ At a maximum point of the function y, $\frac{d^2y}{dx^2}$ <0

@@ True ~
@@ False

^^ At a maximum point of the function y, $\frac{d^2y}{dx^2}$ >0

@@ True
@@ False ~

SECTION 8

^^ The function $y = x^3$ has an extremum value at $x = 0$. What is the nature of the extremum value ?
@@ a maximum
@@ a minimum
@@ point of inflexion ~
@@ local minimum
^^ A cuboid with volume $V = (10 - 2x) \times (10 - 2x) \times x$ is formed from a sheet of paper 10cm ×10cm . What is the maximum volume that this cuboid can ever have?

@@ $74\frac{2}{27}$ cm^3 ~

@@ $50\frac{1}{2}$ cm^3

@@ 96 cm^3
@@ 100 cm^3

^^ If $y = t^3 - 3t + 2$. Find the maximum value of t.

@@ -1

@@ 2

@@ 4 ~

@@ 1
^^ A stone is thrown vertically upwards from the top of a cliff 60cm at 20m/s. find the maximum height attained by the stone (taking $g = 10cm/s^2$)
@@ 20cm
@@ 40cm
@@ 60cm
@@ 80cm ~
^^ A cuboid with volume $V = (10 - 2x) \times (10 - 2x) \times x$ is formed from a sheet of paper 10cm ×10cm . For what value of x does the cuboid has its minimum volume.

@@ 2cm
@@ 3cm
@@ 4cm
@@ 5cm ~

^^ A cuboid with volume $V = (10 - 2x) \times (10 - 2x) \times x$ is formed from a sheet of paper $10cm \times 10cm$. What is the minimum volume that this cuboid can ever have?
@@ 4 cm^3
@@ 0 cm^3 ~
@@ 2 cm^3
@@ 3 cm^3

^^ If $y = x^3 - 3x + 2$. The minimum value of y is:

@@ -1

@@ 2

@@ 0 ~

@@ 1
^^ The cost T of a product is a function of the quantity x of the product is given by the relation: $T(x) = 2x^2 - 4000x + 50$. Find the quantity for which the cost is a minimum.

@@ 4000

@@ 2000

@@ 1500

@@ 1000 ~
^^ The function $y = x^4 - 4x^3 + 10$ has a minimum value in the interval $0 \leq x \leq 5$. The coordinates of the minimum point is
@@ (2, -6)
@@ (1.8, 0)
@@ (3.8, 0)
@@ (3, -17) ~
^^ The function $y = x^4 - 4x^3 + 10$ has a minimum value in the interval $-2 \leq x \leq 2$. The coordinates of the point of inflexion
@@ (2, 10)
@@ (0, 10) ~
@@ (1,10)
@@ (-2, 10)
^^ The coordinate of the turning points of the curve $y = x^3 - 3x + 2$ are:
@@ (-1, 4) and (1, 0) ~
@@ (-1, 0) and (1, 4)
@@ (4, -1) and (0, 1)
@@ (-1, 1) and (0, 4)

SECTION 9

^^ The conic represented by the equations $x = -1 + 5\cos\theta$ and $y - 2 = 4\sin\theta$ is

@@ $\frac{(x+1)^2}{25} + \frac{(y-2)^2}{16} = 1$ ~

@@ $\frac{(x+1)^2}{25} - \frac{(y-2)^2}{16} = 1$

@@ $\frac{(x+1)^2}{25} + \frac{(y+2)^2}{16} = 1$

@@ $\frac{(x-1)^2}{25} + \frac{(y-2)^2}{16} = 1$

^^ The conic represented by the equations $x = 1 + 6\cos\theta$ and $y - 2 = 4\sin\theta$ is

@@ $\frac{(x-1)^2}{36} + \frac{(y-2)^2}{16} = 1$ ~

@@ $\frac{(x+1)^2}{36} - \frac{(y-2)^2}{16} = 1$

@@ $\frac{(x+1)^2}{36} + \frac{(y+2)^2}{16} = 1$

@@ $\frac{(x-1)^2}{36} - \frac{(y-2)^2}{16} = 1$

^^ The conic represented by the equations $x = -3 + 5\cos\theta$ and $y - 2 = 4\sin\theta$ is

@@ $\frac{(x+3)^2}{25} + \frac{(y-2)^2}{16} = 1$ ~

@@ $\frac{(x+3)^2}{25} - \frac{(y-2)^2}{16} = 1$

@@ $\frac{(x+3)^2}{25} + \frac{(y+2)^2}{16} = 1$

@@ $\frac{(x-3)^2}{25} + \frac{(y-2)^2}{16} = 1$

^^ The conic represented by the equations $x = -1 + 5\cos\theta$ and $y - 7 = 4\sin\theta$ is

@@ $\frac{(x+1)^2}{25} + \frac{(y-7)^2}{16} = 1$ ~

@@ $\frac{(x+1)^2}{25} - \frac{(y-7)^2}{16} = 1$

@@ $\frac{(x+1)^2}{25} + \frac{(y+7)^2}{16} = 1$

@@ $\frac{(x-1)^2}{25} + \frac{(y-7)^2}{16} = 1$

^^ The conic represented by the equations $x = -1 + 5\cos\theta$ and $y - 2 = 6\sin\theta$ is

@@ $\frac{(x+1)^2}{25}+\frac{(y-2)^2}{36}=1$ ~
@@ $\frac{(x+1)^2}{25}-\frac{(y-2)^2}{36}=1$
@@ $\frac{(x+1)^2}{25}+\frac{(y+2)^2}{36}=1$
@@ $\frac{(x-1)^2}{25}+\frac{(y-2)^2}{36}=1$
^^ The conic represented by the equations $x=2+5\cos\theta$ and $y=2+6\sin\theta$ is
@@ $\frac{(x-2)^2}{25}+\frac{(y-2)^2}{36}=1$ ~
@@ $\frac{(x+2)^2}{25}-\frac{(y-2)^2}{36}=1$
@@ $\frac{(x+1)^2}{25}+\frac{(y+2)^2}{36}=1$
@@ $\frac{(x-1)^2}{25}+\frac{(y-2)^2}{36}=1$
^^ The conic represented by the equations $x=2+3\cos\theta$ and $y=2+2\sin\theta$ is
@@ $\frac{(x-2)^2}{9}+\frac{(y-2)^2}{4}=1$ ~
@@ $\frac{(x+2)^2}{9}-\frac{(y-2)^2}{4}=1$
@@ $\frac{(x+1)^2}{9}+\frac{(y+2)^2}{4}=1$
@@ $\frac{(x-1)^2}{9}+\frac{(y-2)^2}{4}=1$
^^ The conic represented by the equations $x=-2+5\cos\theta$ and $y=2+2\sin\theta$ is
@@ $\frac{(x+2)^2}{25}+\frac{(y-2)^2}{4}=1$ ~
@@ $\frac{(x+2)^2}{25}-\frac{(y-2)^2}{4}=1$
@@ $\frac{(x+2)^2}{25}+\frac{(y+2)^2}{4}=1$
@@ $\frac{(x-2)^2}{25}+\frac{(y-2)^2}{4}=1$
^^ The conic represented by the equations $x=-4+5\cos\theta$ and $y=2+6\sin\theta$ is
@@ $\frac{(x+4)^2}{25}+\frac{(y-2)^2}{36}=1$ ~
@@ $\frac{(x+4)^2}{25}-\frac{(y-2)^2}{36}=1$

@@ $\frac{(x\ +4)^2}{25}\ +\frac{(y\ +2)^2}{36}\ =1$

@@ $\frac{(x\ -4)^2}{25}\ +\frac{(y\ -2)^2}{36}\ =1$

^^ The conic represented by the equations x = -4 +5cosθ and y =5 +6sinθ is

@@ $\frac{(x\ +4)^2}{25}\ +\frac{(y\ -5)^2}{36}\ =1$ ~

@@ $\frac{(x\ +4)^2}{25}\ -\frac{(y\ -5)^2}{36}\ =1$

@@ $\frac{(x\ +4)^2}{25}\ +\frac{(y\ +5)^2}{36}\ =1$

@@ $\frac{(x\ -4)^2}{25}\ +\frac{(y\ -5)^2}{36}\ =1$

SECTION 10

^^ The conic represented by the equations x = -1 +5secθ and y -2 =4tanθ is

@@ $\frac{(x\ +1)^2}{25}\ -\frac{(y\ -2)^2}{16}\ =1$ ~

@@ $\frac{(x\ +1)^2}{25}\ +\frac{(y\ -2)^2}{16}\ =1$

@@ $\frac{(x\ +1)^2}{25}\ +\frac{(y\ +2)^2}{16}\ =1$

@@ $\frac{(x\ -1)^2}{25}\ +\frac{(y\ -2)^2}{16}\ =1$

^^ The conic represented by the equations x =1 +6secθ and y -2 =4tanθ is

@@ $\frac{(x\ -1)^2}{36}\ -\frac{(y\ -2)^2}{16}\ =1$ ~

@@ $\frac{(x\ +1)^2}{36}\ -\frac{(y\ -2)^2}{16}\ =1$

@@ $\frac{(x\ +1)^2}{36}\ +\frac{(y\ +2)^2}{16}\ =1$

@@ $\frac{(x\ +1)^2}{36}\ -\frac{(y\ -2)^2}{16}\ =1$

^^ The conic represented by the equations x = -3 +5secθ and y -2 =4tanθ is

@@ $\frac{(x\ +3)^2}{25}\ -\frac{(y\ -2)^2}{16}\ =1$ ~

@@ $\frac{(x\ +3)^2}{25}\ +\frac{(y\ -2)^2}{16}\ =1$

@@ $\frac{(x+3)^2}{25}+\frac{(y+2)^2}{16}=1$

@@ $\frac{(x-3)^2}{25}+\frac{(y-2)^2}{16}=1$

^^ The conic represented by the equations $x=-1+5\sec\theta$ and $y-7=4\tan\theta$ is

@@ $\frac{(x+1)^2}{25}-\frac{(y-7)^2}{16}=1$ ~

@@ $\frac{(x+1)^2}{25}+\frac{(y-7)^2}{16}=1$

@@ $\frac{(x+1)^2}{25}+\frac{(y+7)^2}{16}=1$

@@ $\frac{(x-1)^2}{25}+\frac{(y-7)^2}{16}=1$

^^ The conic represented by the equations $x=-1+5\sec\theta$ and $y-2=6\tan\theta$ is

@@ $\frac{(x+1)^2}{25}-\frac{(y-2)^2}{36}=1$ ~

@@ $\frac{(x+1)^2}{25}+\frac{(y-2)^2}{36}=1$

@@ $\frac{(x+1)^2}{25}-\frac{(y+2)^2}{36}=1$

@@ $\frac{(x-1)^2}{25}+\frac{(y-2)^2}{36}=1$

^^ The conic represented by the equations $x=2+5\sec\theta$ and $y=2+6\tan\theta$ is

@@ $\frac{(x-2)^2}{25}-\frac{(y-2)^2}{36}=1$ ~

@@ $\frac{(x+2)^2}{25}-\frac{(y-2)^2}{36}=1$

@@ $\frac{(x+1)^2}{25}+\frac{(y+2)^2}{36}=1$

@@ $\frac{(x-1)^2}{25}+\frac{(y-2)^2}{36}=1$

^^ The conic represented by the equations $x=2+3\sec\theta$ and $y=2+2\tan\theta$ is

@@ $\frac{(x-2)^2}{9}-\frac{(y-2)^2}{4}=1$ ~

@@ $\frac{(x+2)^2}{9}-\frac{(y-2)^2}{4}=1$

@@ $\frac{(x+1)^2}{9}+\frac{(y+2)^2}{4}=1$

@@ $\frac{(x-1)^2}{9}+\frac{(y-2)^2}{4}=1$

^^ The conic represented by the equations $x = -2 + 5\sec\theta$ and $y = 2 + 2\tan\theta$ is
@@ $\frac{(x+2)^2}{25} - \frac{(y-2)^2}{4} = 1$ ~
@@ $\frac{(x+2)^2}{25} + \frac{(y-2)^2}{4} = 1$
@@ $\frac{(x+2)^2}{25} + \frac{(y+2)^2}{4} = 1$
@@ $\frac{(x-2)^2}{25} - \frac{(y-2)^2}{4} = 1$
^^ The conic represented by the equations $x = -4 + 5\sec\theta$ and $y = 2 + 6\tan\theta$ is
@@ $\frac{(x+4)^2}{25} - \frac{(y-2)^2}{36} = 1$ ~
@@ $\frac{(x+4)^2}{25} + \frac{(y-2)^2}{36} = 1$
@@ $\frac{(x+4)^2}{25} - \frac{(y+2)^2}{36} = 1$
@@ $\frac{(x-4)^2}{25} + \frac{(y-2)^2}{36} = 1$
^^ The conic represented by the equations $x = -4 + 5\sec\theta$ and $y = 5 + 6\tan\theta$ is
@@ $\frac{(x+4)^2}{25} - \frac{(y-5)^2}{36} = 1$ ~
@@ $\frac{(x+4)^2}{25} + \frac{(y-5)^2}{36} = 1$
@@ $\frac{(x+4)^2}{25} + \frac{(y+5)^2}{36} = 1$
@@ $\frac{(x-4)^2}{25} - \frac{(y-5)^2}{36} = 1$

SECTION 11

^^ The conic represented by the equations $x = 4t^2$ and $y = 8t$ is
@@ $y^2 = 16x$ ~
@@ $y^2 = 8x$
@@ $y^2 = 4x$
@@ $y^2 = -16x$
^^ The conic represented by the equations $x = 6t^2$ and $y = 12t$ is
@@ $y^2 = 24x$ ~
@@ $y^2 = 12x$
@@ $y^2 = 6x$

@@ y^2 = -24x
^^ The conic represented by the equations x =5t^2 and y =10t is
@@ y^2 =20x ~
@@ y^2 =10x
@@ y^2 =5x
@@ y^2 = -20x
^^ The conic represented by the equations x =8t^2 and y =16t is
@@ y^2 =32x ~
@@ y^2 =16x
@@ y^2 =8x
@@ y^2 = -32x
^^ The conic represented by the equations x =3t^2 and y =6t is
@@ y^2 =12x ~
@@ y^2 =6x
@@ y^2 =3x
@@ y^2 = -12x
^^ The conic represented by the equations x =7t^2 and y =14t is
@@ y^2 =28x ~
@@ y^2 =14x
@@ y^2 =7x
@@ y^2 = -28x
^^ The conic represented by the equations x =9t^2 and y =18t is
@@ y^2 =36x ~
@@ y^2 =18x
@@ y^2 =9x
@@ y^2 = -36x
^^ The conic represented by the equations x =11t^2 and y =22t is
@@ y^2 =44x ~
@@ y^2 =22x
@@ y^2 =11x
@@ y^2 = -44x
^^ The conic represented by the equations x =t^2 and y =2t is
@@ y^2 =4x ~
@@ y^2 =2x
@@ y^2 =x
@@ y^2 = -4x
^^ The conic represented by the equations x =0.5t^2 and y =t is
@@ y^2 =2x ~
@@ y^2 =x
@@ y^2 =0.5x
@@ y^2 = -2x

SECTION 12

^^ The degree of the differential equation $\frac{d^3y}{dx^3} - 8x\left(\frac{dy}{dx}\right) = y\frac{d^2y}{dx^2} + e^y$ is

@@ 1 ~
@@ 2
@@ 3
@@ 4

^^ Classify the following differential equation: $e^{2x}\frac{dy}{dx} - 2y = x^3y$

@@ separable and not linear
@@ linear and not separable
@@ both separable and linear ~
@@ neither separable nor linear

^^ Classify the following differential equation: $e^{2x}\frac{dy}{dx} - 2y^2 = x^3y^2$

@@ separable and not linear ~
@@ linear and not separable
@@ both separable and linear
@@ neither separable nor linear

^^ An integrating factor, $I(x)$, for the linear differential equation $(1 + x^2)\frac{dy}{dx} + xy = 0$

@@ $I(x) = e^{\frac{x^2}{2}}$
@@ $I(x) = 1 + x^2$
@@ $I(x) = \sqrt{1 + x^2}$ ~
@@ $I(x) = e^{\frac{1 + x^2}{2}}$

^^ The order of the differential equation $\frac{d^3y}{dx^3} + 4x\left(\frac{dy}{dx}\right) = y\frac{d^2y}{dx^2} + e^y$ is

@@ 1
@@ 2
@@ 3 ~
@@ 4

^^ The order of the differential equation $\frac{d^5y}{dx^5} + 4x\left(\frac{dy}{dx}\right)^3 = y\frac{d^2y}{dx^2} + e^y$ is

@@ 3

@@ 2
@@ 5 ~
@@ 4
^^ Consider the linear ordinary differential equation $\frac{dy}{dx} - \frac{2x}{1+x^2}y = 1 + x$. The integrating factor is:
@@ $\frac{1}{1+x^2}$ ~
@@ $1 + x^2$
@@ $e^{(1+x^2)}$
@@ $e^{-(1+x^2)}$
^^ Consider the linear ordinary differential equation $x\frac{dy}{dx} - y = 1$. The integrating factor is:
@@ $\frac{1}{x}$ ~
@@ $1 + x$
@@ $e^{(1+x^2)}$
@@ $e^{-(1+x^2)}$
^^ Classify the following differential equation: $w\frac{dw}{dx} + 3t = 10$
@@ separable and not linear ~
@@ linear and not separable
@@ both separable and linear
@@ neither separable nor linear
^^ Find the differential of y given that $y = x^2 - 2x + 2$ if x changes from 3.0 to 3.2
@@ 0.7
@@ 0.9
@@ 0.8 ~
@@ 0.6
^^ The degree of the differential equation $\frac{d^3y}{dx^3} + 6x\left(\frac{dy}{dx}\right) = y\frac{d^2y}{dx^2} + e^y$ is
@@ 1 ~
@@ 2
@@ 3
@@ 4
^^ The degree of the differential equation $\left(\frac{d^3y}{dx^3}\right)^2 - 8x\left(\frac{dy}{dx}\right) = y\frac{d^2y}{dx^2} + e^y$ is
@@ 2 ~
@@ 1
@@ 3

@@ 4

SECTION 13

^^An ellipse has a major axis of 20 and a minor axis of 12. A possible equation for this ellipse is:

@@ $\frac{x^2}{100}+\frac{y^2}{36}=1$ ~

@@ $\frac{x^2}{400}+\frac{y^2}{144}=1$

@@ $\frac{x^2}{100}+\frac{y^2}{144}=1$

@@ $\frac{x^2}{400}+\frac{y^2}{36}=1$

^^An ellipse has a major axis of 10 and a minor axis of 8. A possible equation for this ellipse is:

@@ $\frac{x^2}{25}+\frac{y^2}{16}=1$ ~

@@ $\frac{x^2}{100}+\frac{y^2}{64}=1$

@@ $\frac{x^2}{10}+\frac{y^2}{8}=1$

@@ $\frac{x^2}{400}+\frac{y^2}{36}=1$

^^An ellipse has a major axis of 20 and a minor axis of 10. A possible equation for this ellipse is:

@@ $\frac{x^2}{100}+\frac{y^2}{25}=1$ ~

@@ $\frac{x^2}{400}+\frac{y^2}{100}=1$

@@ $\frac{x^2}{100}+\frac{y^2}{10}=1$

@@ $\frac{x^2}{400} + \frac{y^2}{20} = 1$

^^An ellipse has a major axis of 16 and a minor axis of 12. A possible equation for this ellipse is:

@@ $\frac{x^2}{64} + \frac{y^2}{36} = 1$ ~

@@ $\frac{x^2}{16} + \frac{y^2}{12} = 1$

@@ $\frac{x^2}{100} + \frac{y^2}{144} = 1$

@@ $\frac{x^2}{400} + \frac{y^2}{36} = 1$

^^An ellipse has a major axis of 18 and a minor axis of 10. A possible equation for this ellipse is:

@@ $\frac{x^2}{81} + \frac{y^2}{25} = 1$ ~

@@ $\frac{x^2}{18} + \frac{y^2}{25} = 1$

@@ $\frac{x^2}{18} + \frac{y^2}{100} = 1$

@@ $\frac{x^2}{400} + \frac{y^2}{36} = 1$

^^An ellipse has a major axis of 40 and a minor axis of 12. A possible equation for this ellipse is:

@@ $\frac{x^2}{200} + \frac{y^2}{36} = 1$ ~

@@ $\frac{x^2}{400} + \frac{y^2}{144} = 1$

@@ $\frac{x^2}{40} + \frac{y^2}{12} = 1$

@@ $\frac{x^2}{400} + \frac{y^2}{36} = 1$

^^An ellipse has a major axis of 22 and a minor axis of 12. A possible equation for this ellipse is:

@@ $\frac{x^2}{121}+\frac{y^2}{36}=1$ ~

@@ $\frac{x^2}{242}+\frac{y^2}{144}=1$

@@ $\frac{x^2}{22}+\frac{y^2}{12}=1$

@@ $\frac{x^2}{400}+\frac{y^2}{144}=1$

SECTION 14

^^ If $y^2-2y-8x-7=0$ is a parabolic equation then the focus is

@@ $(1, 0)$

@@ $(0, 1)$

@@ $(-1, -1)$

@@ $(1, 1)$ ~

^^ The equation of a parabola when the focus is at $(4, 0)$ and vertex $(1, 0)$ is given as

@@ $y^2=8(x+1)$

@@ $(y-1)^2=12x$

@@ $y^2=12(x-1)$ ~

@@ $y^2=8(x-1)$

^^ The focus and directrix of the parabola $y^2=9x$ are

@@ $\left(\frac{9}{4}, 0\right)$ *and* $-\frac{9}{4}$ ~

@@ $\left(\frac{9}{4}, 0\right)$ *and* $-\frac{9}{4}$

@@ $\left(\frac{9}{4}, 0\right)$ *and* $-\frac{9}{4}$

@@ $\left(\frac{9}{4}, 0\right)$ *and* $-\frac{9}{4}$

^^ The equation of the parabola with focus $\left(0, -\frac{1}{2}\right)$ and directrix $\frac{1}{2}$ is

@@ $y^2=-4x$

@@ $x^2 = -2y$ ~

@@ $x^2 = 4y$

@@ $y^2 = -2x$

^^ Given that focus: $(4, 0)$ and directrix: $x = -4$, then the equation of the parabola is

@@ $y^2 = -16x$

@@ $x^2 = -16y$

@@ $y^2 = 16x$ ~

@@ $y^2 = 8x$

^^ Find the equation of the parabola with vertex at the origin and focus $(6, 0)$

@@ $x^2 = 24y$

@@ $y^2 = -24x$

@@ $y^2 = 24x$ ~

@@ $x^2 = -24y$

^^ Find the focus of the equation $x^2 + 3y = 0$

@@ $\left(0, \frac{4}{3}\right)$

@@ $\left(-\frac{3}{4}, 0\right)$

@@ $\left(0, -\frac{3}{4}\right)$ ~

@@ $\left(-\frac{4}{3}, 0\right)$

^^ What is the required parabolic equation with focus $\left(0, -\frac{1}{2}\right)$ and the directrix: $y = \frac{1}{2}$

@@ $y^2 = 4x$

@@ $y^2 = -4x$

@@ $x^2 = 2y$

@@ $x^2 = -2y$ ~

^^ The focus of the parabola $y^2 = 80x$ is

@@ $(0, 10)$

@@ $(-20, 0)$

@@ $(20, 0)$ ~

@@ $(0, -10)$

^^ The focus and directrix of the parabola $x^2 = 9y$ respectively are

@@ $\left(\frac{9}{4}, 0\right)$ and $\frac{9}{4}$ ~

@@ $\left(0, \frac{9}{4}\right)$ and $-\frac{9}{4}$

@@ $\left(0, -\frac{9}{4}\right)$ and $\frac{9}{4}$

@@ $\left(-\frac{9}{4}, 0\right)$ and $-\frac{9}{4}$

^^ The focus and directrix of the parabola $x^2 = -9y$ respectively are

@@ $\left(-\frac{9}{4}, 0\right)$ and $-\frac{9}{4}$

@@ $\left(\frac{9}{4}, 0\right)$ and $\frac{9}{4}$

@@ $\left(0, -\frac{9}{4}\right)$ and $\frac{9}{4}$ ~

@@ $\left(0, \frac{9}{4}\right)$ and $-\frac{9}{4}$

^^ The focus and directrix of the parabola $y^2 = -9x$ respectively are

@@ $\left(-\frac{9}{4}, 0\right)$ and $\frac{9}{4}$ ~

@@ $\left(0, -\frac{9}{4}\right)$ and $-\frac{9}{4}$

@@ $\left(0, -\frac{9}{4}\right)$ and $\frac{9}{4}$

@@ $\left(\frac{9}{4}, 0\right)$ and $-\frac{9}{4}$

^^ The focus and directrix of the parabola $y^2 = 4x$ respectively are

@@ $(-4, 0)$ and 4

@@ $(-1, 0)$ and 1

@@ $(4, 0)$ and -4

@@ $(1, 0)$ *and* -1 ~

^^ The focus and directrix of the parabola $y^2 = -4x$ respectively are

@@ $(-1, 0)$ *and* 1 ~

@@ $(-4, 0)$ *and* 4

@@ $(1, 0)$ *and* -1

@@ $(4, 0)$ *and* -4

^^ Given that focus $(-4, 0)$ and directrix $x = 4$, then the equation of the parabola is

@@ $y^2 = 16x$

@@ $y^2 = -16x$ ~

@@ $x^2 = -16y$

@@ $x^2 = 16y$

^^ Given that focus $(0, -4)$ and directrix $y = 4$, then the equation of the parabola is

@@ $y^2 = 16x$

@@ $y^2 = -16x$

@@ $x^2 = 16y$

@@ $x^2 = -16y$ ~

^^ Given that focus $\left(0, \frac{1}{2}\right)$ and directrix $y = -\frac{1}{2}$, then the equation of the parabola is

@@ $x^2 = \frac{1}{2}x$

@@ $x^2 = -\frac{1}{2}y$

@@ $x^2 = 2y$ ~

@@ $y^2 = 2x$

^^ Given that focus $\left(-\frac{1}{2}, 0\right)$ and directrix $x = \frac{1}{2}$, then the equation of the parabola is

@@ $y^2 = -2x$ ~

@@ $x^2 = -2y$

@@ $x^2 = 2y$

@@ $y^2 = 2x$

^^ Given that focus $(0, 4)$ and directrix $y = -4$, then the equation of the parabola is

@@ $x^2 = 16y$ ~

@@ $y^2 = -16x$

@@ $y^2 = 16x$

@@ $x^2 = -16y$

^^ The focus of the equation $x^2 - 3y = 0$ is

@@ $\left(0, \frac{3}{4}\right)$ ~

@@ $\left(0, -\frac{3}{4}\right)$

@@ $\left(0, \frac{4}{3}\right)$

@@ $\left(0, -\frac{4}{3}\right)$

^^ The focus of the equation $y^2 + 3x = 0$ is

@@ $\left(0, \frac{3}{4}\right)$

@@ $\left(-\frac{3}{4}, 0\right)$ ~

@@ $\left(\frac{4}{3}, 0\right)$

@@ $\left(0, -\frac{4}{3}\right)$

^^ The focus of the equation $y^2 - 3x = 0$ is

@@ $\left(-\frac{3}{4}, 0\right)$

@@ $\left(0, \frac{3}{4}\right)$

@@ $\left(\frac{3}{4}, 0\right)$ ~

@@ $\left(0, -\frac{3}{4}\right)$

^^ The focus of the equation $x^2 - 24y = 0$ is

@@ $(6, 0)$

@@ $(0, -6)$

@@ $(0, 6)$ ~

@@ $(-6, 0)$

^^ The focus of the equation $y^2 + 24x = 0$ is

@@ $(0, 6)$

@@ $(0, -6)$

@@ $(-6, 0)$ ~

@@ $(6, 0)$

SECTION 15

^^ If the lactus rectum of a parabola is $\frac{\sqrt{7}}{3}$, its focal length is

@@ $\frac{\sqrt{3}}{12}$ ~

@@ $\frac{12}{\sqrt{3}}$

@@ $-\frac{\sqrt{3}}{12}$

@@ $-\frac{12}{\sqrt{3}}$

^^ If the lactus rectum of a parabola is $\frac{7}{\sqrt{3}}$, its focal length is

@@ $\frac{4\sqrt{3}}{7}$

@@ $\frac{7}{4\sqrt{3}}$ ~

@@ $-\frac{7}{4\sqrt{3}}$

@@ $-\frac{4\sqrt{3}}{7}$

^^ If the lactus rectum of a parabola is 4, its focal length is

@@ 4

@@ -4
@@ 1 ~
@@ -1

^^ If the lactus rectum of a parabola is $\frac{1}{\sqrt{2}}$, its focal length is

@@ $4\sqrt{2}$

@@ $-\frac{1}{4\sqrt{2}}$

@@ $-4\sqrt{2}$

@@ $\frac{1}{4\sqrt{2}}$ ~

^^ If the lactus rectum of a parabola is $\frac{\sqrt{3}}{2}$, its focal length is

@@ $\frac{\sqrt{3}}{8}$ ~

@@ $\frac{8}{\sqrt{3}}$

@@ $-\frac{\sqrt{3}}{8}$

@@ $-\frac{8}{\sqrt{3}}$

^^ The length of lactus rectum of the parabola $x^2 - 6x - 2y + 5 = 0$ is

@@ 2 ~
@@ 4
@@ -4
@@ -2

^^ If the lactus rectum of a parabola is $\frac{3}{\sqrt{7}}$, its focal length is

@@ $-\frac{4\sqrt{7}}{3}$

@@ $\frac{12}{\sqrt{7}}$

@@ $-\frac{\sqrt{7}}{3}$

@@ $\frac{3}{4\sqrt{7}}$ ~

^^ The length of the lactum rectum of the parabola $y^2+12y+8x+20=0$ is

@@ 8 ~

@@ 4

@@ 2

@@ -8

^^ A parabola with length of lactum rectum $\frac{1}{6}$ and vertex $(0, -1)$ is given as

@@ $6(y+1)^2=-x$ ~

@@ $(y+1)^2=-6x$

@@ $(y-1)^2=6x$

@@ $6(y-1)^2=x$

^^ If the lactum rectum of a parabola is -4 its focal length is

@@ 1

@@ -1 ~

@@ 4

@@ -4

^^ The length of lactum rectum of the parabola $x^2-2x-y+6=0$ is

@@ 1 ~

@@ 2

@@ 3

@@ 4

^^ The length of lactum rectum of the parabola $y^2-7y-7x+3=0$ is

@@ 5

@@ 7 ~

@@ 6

@@ 8

^^ The length of lactum rectum of the parabola $y^2-6y-2x+5=0$ is

@@ 3

@@ 2 ~

@@ 1

@@ 4

^^ The length of lactum rectum of the parabola $x^2+8x-3y+7=0$ is

@@ 1

@@ 2

@@ 3 ~
@@ 4
^^ The length of lactum rectum of the parabola $y^2 + 14y + 4x + 5 = 0$ is
@@ 3
@@ 4 ~
@@ 2
@@ 1

SECTION 16

^^ If $x^2 = 2y$ is a parabolic equation, then its directrix is
@@ $y = -\frac{1}{2}$ ~
@@ $x = \frac{3}{2}$
@@ $x = \frac{1}{2}$
@@ $y = \frac{1}{2}$
^^ The equation of a normal to the parabola $y^2 = 4ax$ at $(1, 0)$ is given as
@@ $y = 0$ ~
@@ $x = 0$
@@ $-2y = a$
@@ $2x = -a$
^^ The equation of tangent to the parabola $x^2 = 4ay$ at the point $(2a, -1)$ is
@@ $y = -x - 2a$
@@ $y = x + 2a$
@@ $y = x + (2a - 1)$
@@ $y = x - (2a + 1)$ ~
^^ The equation of tangent to the parabola $y^2 = 4ax$ at the point $(at^2, 2at)$ is
@@ $t^2 y = xt + at$
@@ $ty = x + at^2$ ~
@@ $y = xt + at^2$
@@ $2y = 2xt + at^2$

^^ The vertex of the parabola $9(x+5)^2 - 3y + 2 = 0$ is

@@ $\left(-5, \frac{2}{3}\right)$ ~

@@ $\left(5, \frac{4}{3}\right)$

@@ $(-1, 2)$

@@ $(0, -2)$

^^ The straight line $x = 4$ intercept the parabola $y^2 = 4(x+1)$ at

@@ $(3, \sqrt{20})$ and $(3 - \sqrt{20})$ ~

@@ $(3, 4)$ and $(3-4)$

@@ $(3, \sqrt{7})$ and $(3 - \sqrt{7})$

@@ $(3, \sqrt{5})$ and $(3 - \sqrt{5})$

^^ The equation of the tangent to the parabola $x^2 = -2y$ at the point $(-1, -1)$ is

@@ $y = x + 1$

@@ $y = x - 1$

@@ $y = x$ ~

@@ $y = x + 3$

^^ The directrix axis of the parabola $x^2 = 4ay$ is

@@ $y = a$ ~

@@ $y = -a$

@@ $x = -a$

@@ $x = a$

^^ Find the equation of the normal to the parabola $x^2 - 6x - 8y + 1 = 0$ at the point $\left(1, -\frac{1}{2}\right)$

@@ $2y - 4x + 5 = 0$ ~

@@ $y - x + 5 = 0$

@@ $y + x - 5 = 0$

@@ $2y - x + 5 = 0$

^^ Find the equation of the normal to the parabola $x^2 - 2x - y + 6 = 0$ at the point $(-2, -2)$

@@ $y-6x-7=0$

@@ $6y-x+10=0$ ~

@@ $6y+x-7=0$

@@ $y+6x+10=0$

^^ Find the equation of the normal to the parabola $y^2-7y-7x+3=0$ at the point $(-2,-2)$

@@ $y+11x=8$

@@ $7y+11x+8=0$

@@ $7y-11x-8=0$ ~

@@ $y-11x+8=0$

^^ Find the equation of the normal to the parabola $y^2-6y-2x+5=0$ at the point $(-2,-2)$

@@ $5y-x+8=0$

@@ $5y+x-8=0$

@@ $y+5x+8=0$

@@ $y-5x-8=0$ ~

^^ Find the equation of the normal to the parabola $x^2+8x-3y+7=0$ at the point $(-2,-2)$

@@ $4y-3x+2=0$ ~

@@ $y-3x+2=0$

@@ $4y-x-2=0$

@@ $y+3x-2=0$

^^ Find the equation of the tangent to the parabola $x^2-6x-8y+1=0$ at the point $\left(2,-\frac{1}{2}\right)$

@@ $4y+x=0$ ~

@@ $y+4x=0$

@@ $y+x+4=0$

@@ $y-4x=3$

^^ Find the equation of the tangent to the parabola $y^2-6y-2x+5=0$ at the point $(-1,-1)$

@@ $y-4x-3=0$

@@ $4y+x+3=0$ ~

@@ $y+2x+3=0$

@@ $y+3x+7=0$

^^ Find the equation of the tangent to the parabola $x^2+8x-3y+7=0$ at the point $(-1, -1)$

@@ $y+3x+4=0$

@@ $2y+2x-1=0$

@@ $y-2x-1=0$ ~

@@ $2y-x+1=0$

^^ Find the equation of the tangent to the parabola $y^2+14y+4x+5=0$ at the point $(-1, -1)$

@@ $y-3x+2=0$

@@ $y+3x-2=0$

@@ $3y+x-2=0$

@@ $3y-x+2=0$ ~

^^ Find the equation of the tangent to the parabola $x^2-2x-y+6=0$ at the point $(-1, -1)$

@@ $y-4x-3=0$ ~

@@ $y+4x-3=0$

@@ $4y+x-3=0$

@@ $4y-x+3=0$

^^ The vertex of the parabola $x^2-2x+4y-7=0$ is

@@ $(1, 2)$ ~

@@ $(2, 1)$

@@ $(-1, -2)$

@@ $(-2, -1)$

^^ The vertex of the parabola $3x^2-5x+2y-4=0$ is

@@ $\left(\frac{5}{6}, \frac{73}{24}\right)$ ~

@@ $\left(\frac{7}{24}, \frac{5}{6}\right)$

@@ $\left(-\frac{5}{6}, -\frac{73}{24}\right)$

@@ $\left(-\frac{7}{24}, -\frac{5}{6}\right)$

^^ The vertex of the parabola $y^2 - 6x + 4y + 16 = 0$ is

@@ $(-2, -2)$

@@ $(-2, 2)$

@@ $(2, -2)$ ~

@@ $(2, 2)$

^^ The vertex of the parabola $(y-2)^2 = -10(x+3)$ is

@@ $(3, 2)$

@@ $(-3, -2)$

@@ $(3, -2)$

@@ $(-3, 2)$ ~

^^ The vertex of the parabola $(x-2)^2 = -10(y+3)$ is

@@ $(-3, 2)$ ~

@@ $(-2, 3)$

@@ $(-2, -3)$

@@ $(2, 3)$

SECTION 17

^^ If $y^2 = 12x$, find its equation of the tangent at the point whose coordinate is 6

@@ $y - x - 3 = 0$ ~

@@ $y^2 - x + 6 = 0$

@@ $y + x - 3 = 0$

@@ $y + x + 6 = 0$

^^ Find the equation of the curve with vertex at the origin and directrix is $x = 6$

@@ $y^2 = -24x$ ~

@@ $y^2 = 12x$

@@ $x^2 = -24y$

@@ $y^2 = 24x$

^^ The equation of tangent to the curve $x^2 = 4y$ at the point $(2, 1)$ is

@@ $y + x = 1$

@@ $y - x = -3$

@@ $y - x = -1$ ~

@@ $x - y = -3$

^^ The directrix of $6y^2 - 9 = 0$ is

@@ $-\frac{3}{8}$ ~

@@ 8

@@ $-\frac{8}{3}$

@@ $\frac{8}{3}$

^^ The slope of normal to the curve $x^2 = 4ay$ at $(at^2, 2at)$ is

@@ $\frac{t^2}{3}$

@@ $-t^2$

@@ $\frac{2t^2}{a}$

@@ $-\frac{2}{t^2}$ ~

^^ The vertex of the curve described by the equation $x = 3t + 1 \ \ and \ \ y = 4t^2$ is

@@ $(-1, 0)$

@@ $(1, 0)$ ~

@@ $(0, -1)$

@@ $(0, 1)$

^^ Given that $x = 2t - 1 \ \ and \ \ y = t^2 + 2$, then the equation of the conic is

@@ $(y+1)^2 = -4(x+2)$

@@ $y^2 = -4(x-1)$

@@ $(y-2)^2 = -4(x+1)$

@@ $(x+1)^2 = 4(y-2)$ ~

^^ The equation of tangent to the curve $x^2 = -4y$ at the point $(2, 1)$ is

@@ $y + x = 3$ ~

@@ $y - x = 3$

@@ $y - x + 3 = 0$

@@ $2y + x = 3$

^^ The equation of tangent to the curve $y^2 = 4x$ at the point $(2, 1)$ is

@@ $y + 2x = 3$

@@ $y - 2x = -3$ ~

@@ $y - 2x = 3$

@@ $y + x = 2$

^^ The equation of tangent to the curve $y^2 = -4x$ at the point $(2, 1)$ is

@@ $y + 5x = 2$

@@ $y - 2x + 5 = 0$

@@ $y + 2x = 5$ ~

@@ $y + x = 5$

^^ The equation of tangent to the curve $x^2 = -4y$ at the point $(-2, -2)$ is

@@ $y - x = 0$ ~

@@ $y + x = 0$

@@ $y - 2x = 5$

@@ $y - x = 2$

^^ The equation of tangent to the curve $y^2 = 4x$ at the point $(-2, -2)$ is

@@ $y + x = -4$ ~

@@ $y - x = 4$

@@ $y + 2x = 3$

@@ $y - 2x = 4$

^^ Given that $x = t^2 + 4$ and $y = 2t + 4$, then the equation of conic is

@@ $(y+4)^2 = 4(x-4)$

@@ $(y-4)^2 = 4(x-4)$ ~

@@ $(y+4)^2 = 2(x-4)$

@@ $(y-4)^2 = -2(x-4)$

^^ Given that $x = 2t^2 + 1$ and $y = t$, then the equation of conic is

@@ $x^2 = 4(y+1)$

@@ $y^2 = \frac{1}{2}(x-1)$ ~

@@ $x^2 = \frac{1}{2}(y-1)$

@@ $y^2 = 4(x+1)$

^^ Given that $x = 3 - t^2$ and $y = 2t$, then the equation of conic is

@@ $y^2 = 4(x+3)$

@@ $x^2 = 4(y+3)$

@@ $x^2 = -4(y-3)$

@@ $y^2 = -4(x-3)$ ~

^^ Given that $x = 2t + 3$ and $y = t^2 - 4$, then the equation of conic is

@@ $(x+3)^2 = -4(y+4)$

@@ $(x-3)^2 = 4(y+4)$ ~

@@ $(y-3)^2 = -4(x+4)$

@@ $(x+3)^2 = -4(y+4)$

^^ Given that $x = t^2 - 7$ and $y = 3t + 7$, then the equation of conic is

@@ $(y-7)^2 = 9(x+7)$ ~

@@ $(x+7)^2 = 9(y-7)$

@@ $(y+7)^2 = 9(x-7)$

@@ $(x-7)^2 = 9(y+7)$