WEEKLY TEST TYJ MATHEMATICS SOLUTION 17 NOVEMBER 2019

41. (b) $a=3 \Rightarrow$ abscissa is $4-3=1$ and $y^2=12, y=\pm 2\sqrt{3}$.

Hence points are $(1, 2\sqrt{3}), (1, -2\sqrt{3})$.

42. (b) Let point be (h,k). But $2h=k$, then $k^2=16h$

$\Rightarrow 4h^2=16h \Rightarrow h=0, h=4 \Rightarrow k=0, k=8$

$\therefore$ Points are (0,0), (4,8). Hence focal distances are respectively $0+a=4,\ 4+4=8$. $(\because a=4)$

43. (c) $x^2=-8y \Rightarrow a=-2$. So, focus $=(0,-2)$

Ends of latus rectum $=(4,-2),(-4,-2)$.

Trick : Since the ends of latus rectum lie on parabola, so only points $(-4,-2)$ and $(4,-2)$ satisfy the parabola

44. (c) Since the axis of parabola is y-axis

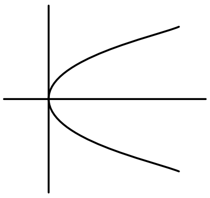
$\therefore$ Equation of parabola $x^2=4ay$

Since it passes through (6, – 3)

$\therefore 36=-12a \Rightarrow a=-3$

$\therefore$ Equation of parabola is $x^2=-12y$.

45. (a) Clearly; parabola $y^2=x$ is symmetric about x-axis.



46. (d) Clearly; $a=\left|\frac{-8}{\sqrt{1+1}}\right|-\left|\frac{-12}{\sqrt{1+1}}\right|=\frac{4}{\sqrt{2}}$

Length of latus rectum = $4a=4\times\frac{4}{\sqrt{2}}=8\sqrt{2}$.

47. (a) $\Delta=(1)(1)(2)+2\left(\frac{3}{2}\right)(0)(-1)-(1)(0)^2-(1)\left(\frac{3}{2}\right)^2-2(-1)^2$

$=2-\frac{9}{4}-2<0$ and $h^2-ab=1-1=0$.

i.e., $h^2=ab \Rightarrow$ a parabola.

48. (a) Check the equation of parabola for the given points.

49. The given equation can be written as $(x-4)^2=y-(c-16)$. Therefore the vertex of the parabola is $(4, c-16)$. The point lies on $x-$axis.

$\therefore c-16=0 \Rightarrow c=16$.

50. (b) Given equation can be written as,

$(y+1)^2 = \frac{3}{2}(x+3)$. So, vertex is $(-3,-1)$.

51. (c) The given equation of parabola is $x^2 - 4x - 8y + 12 = 0$

$\Rightarrow \quad x^2 - 4x = 8y - 12 \Rightarrow (x-2)^2 = 8(y-1)$

Hence the length of latus rectum $= 4a = 8$.

52. (d) Equation of parabola

$y^2 - 2y - x + 2 = 0 \Rightarrow (y-1)^2 = (x-1)$

Let $y - 1 = Y$ and $x - 1 = X$

$Y^2 = X, a = 1/4$, focus $= (1/4, 0)$

$\therefore$ Required focus $= \left(\frac{1}{4} + 1, 0 + 1\right) = (5/4, 1)$.

53. (b) $VS = \sqrt{(2-2)^2 + (-3+1)^2} = 2$. From $(x-h)^2 = -4a(y-k)$

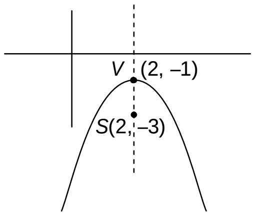
Parabola is,

$(x-2)^2 = -4.2(y+1)$

$\Rightarrow (x-2)^2 = -8(y+1)$

$\Rightarrow x^2 + 4 - 4x = -8y - 8$

$\Rightarrow x^2 - 4x + 8y + 12 = 0.$



54. (a) $SP = PM \Rightarrow SP^2 = PM^2$

$\Rightarrow x^2 + y^2 = \left(\frac{x + y - 4}{\sqrt{2}}\right)^2$

$\Rightarrow x^2 + y^2 - 2xy + 8x + 8y - 16 = 0.$

55. (a) Given, equation of parabola is $x^2 + 8y - 2x = 7 \Rightarrow x^2 - 2x + 8y - 7 = 0$

$\Rightarrow x^2 - 2x + 1 + 8y - 7 - 1 = 0 \Rightarrow (x-1)^2 + 8y = 8$

$\Rightarrow (x-1)^2 = -8(y-1) \Rightarrow (x-1)^2 = -4.2(y-1)$

Here, $a = 2$.

$\therefore$ Equation of directrix is $y - 1 = 2$ *i.e.,* $y = 3$.