1. The locus of the point (x, y) whose distance from the line $y = 2x + 2$ is equal to the distance from $(2, 0)$, is a parabola with the length of latus rectum same as that of the parabola $y = Kx^2$, then the value of K is equal to

(1) $\frac{\sqrt{5}}{12}$ (2) $\frac{\sqrt{5}}{4}$

(3) $\frac{4}{\sqrt{5}}$ (4) $\frac{12}{\sqrt{5}}$

2. The line $x - 1 = 0$ is the directrix of the parabola $y^2 - kx + 8 = 0$. Then the absolute value of the product of values of k is

3. If the line $y - 2 = 0$ is the directrix of the parabola $x^2 - ky + 32 = 0,\ k \neq 0$ and the parabola intersects the circle $x^2 + y^2 = 8$ at two real distinct points, then the absolute value of k is

4. If the point $(2a,\ a)$ lies inside the parabola $x^2 - 2x - 4y + 3 = 0$, then a lies in the interval

(1) $\left[\frac{1}{2}, \frac{3}{2}\right]$ (2) $\left(\frac{1}{2}, \frac{3}{2}\right)$

(3) $(1, 3)$ (4) $\left(\frac{-3}{2}, \frac{-1}{2}\right)$

5. An equilateral triangle is inscribed in the parabola $y^2 = 4ax$, whose vertex is at the vertex of the parabola. If the length of its side is $ka\sqrt{3}$ then find k.

6. The value of λ for which the curve $(7x + 5)^2 + (7y + 3)^2 = \lambda^2(4x + 3y - 24)^2$ represents a parabola, is

(1) $\pm\frac{6}{5}$ (2) $\pm\frac{7}{5}$

(3) $\pm\frac{1}{5}$ (4) $\pm\frac{2}{5}$

7. If PSQ is the focal chord of the parabola $y^2 - 8x = 2y - 17$, such that $SP = 6$. Then the length of SQ is (where S is focus)

8. A chord is drawn through the focus of the parabola $y^2 = 6x$ such that its distance from the vertex of this parabola is $\frac{\sqrt{5}}{2}$, then its slope can be:

(1) $\frac{\sqrt{5}}{2}$ (2) $\frac{\sqrt{3}}{2}$

(3) $\frac{2}{\sqrt{5}}$ (4) $\frac{2}{\sqrt{3}}$

9. Chord joining two distinct points $P(a, 4b)$ and $Q\left(c, -\frac{16}{b}\right)$ (both are variable points) on the parabola $y^2 = 16x$ always passes through a fixed point (α, β). Then, which of the following statements is correct?

(1) $\alpha + \beta = 2$ (2) $\alpha - \beta = 4$

(3) $|\alpha| + |\beta| = 8$ (4) $|\alpha| = |\beta|$

10. A variable point P divides every chord (having slope 2) of the parabola $y^2 = 4x$ into two parts such that the length of one part is twice the other. If locus of P is also a parabola, then find the coordinates of focus of the locus of point P.

(1) $\left(\frac{1}{9}, \frac{4}{9}\right)$ (2) $\left(\frac{2}{9}, \frac{8}{9}\right)$

(3) $\left(\frac{2}{9}, \frac{-4}{9}\right)$ (4) $\left(\frac{1}{3}, \frac{8}{9}\right)$