

6. The maximum intensity will be received at the focus.

The eqn of the parabola

$$y = \frac{1}{4a} x^2$$

Focus at $(0, a)$.

Here $(6, 9)$ is a point on the parabola

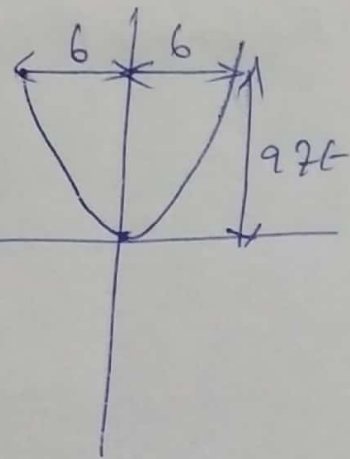
$$9 = \frac{1}{4a} (6^2)$$

$$9 = \frac{1}{4a} \times 36$$

$$\frac{4a}{36} = \frac{1}{9}$$

$$a = \frac{36 \times 9}{9 \times 4} \Rightarrow 1$$

$\Rightarrow$ the receiver should be placed at a distance of 176 from the bottom center of dish.



7. Given foci: $(0, \pm 4)$ and vertices $(0, \pm 6)$

equation of the ellipse is

$$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$$

$$\text{Vertices } (0, \pm a) = a \Rightarrow 6$$

$$\text{Here } c = 4$$

$$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$$

$$b^2 = a^2 - c^2 \Rightarrow b^2 = 36 - 16$$

$$b^2 = 20 \quad b = \sqrt{20} = 2\sqrt{5}$$

$$\frac{x^2}{20} + \frac{y^2}{36} = 1$$