(8) : Given, radius of curvature, $R = 2\text{m}$

Focal length of mirror, $f = \frac{R}{2} = 1\text{ m}$

Distance of approaching car $= 24$ m

From mirror formula $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

or $\quad v = \frac{u \cdot f}{u - f} = \frac{(-24)\cdot(1)}{(-24-1)} = \frac{24}{25}$

Magnification, $m = \frac{-v}{u} = \frac{-24}{25\times(-24)} = \frac{1}{25}$ ...(i)

From lens formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$

Speed of image, $v_I = m^2 v_o$, where v_o is speed of object

$$= \frac{-1}{(25)^2}(25)$$

$v_I = \frac{-1}{25}$ ...(ii)

Differentiating the lens formula, $\frac{-1}{v^2}\frac{dv}{dt} + \frac{1}{u^2}\frac{du}{dt} = 0$

Differentiating it again with respect to time.

$$\frac{2}{v^3}\left(\frac{dv}{dt}\right)^2 - \frac{1}{v^2}\left(\frac{d^2v}{dt^2}\right) - \frac{2}{u^3}\left(\frac{du}{dt}\right)^2 + \frac{1}{u^2}\frac{d^2u}{dt^2} = 0$$

$$\frac{2}{v^3}(v_I)^2 - \frac{1}{v^2}(a) - \frac{2}{u^3}(v_o)^2 + \frac{a_o}{u^2} = 0$$

Since, $a_0 = 0$

$$\therefore \quad a = 2v^2\left(\frac{v_I^2}{v^3} - \frac{v_0^2}{u^3}\right)$$

$$a = \frac{(2)(25)}{24}\cdot\left(\frac{-1}{25}\right)^2 - \frac{2}{(24)^3}\left(\frac{24}{25}\right)^2\cdot(25)^2$$

$$a = \frac{1}{(12)(25)} - \frac{1}{12} = \frac{1}{12}\left[\frac{1}{25} - \frac{1}{1}\right]; \quad a = \frac{-2}{25}$$

$$\therefore \quad |100\,a| = \frac{2}{25}\times 100 = 8$$