1. The point at which the normal to the curve

$$y = x + \frac{1}{x}\,, x > 0 \tag{1}$$

is perpendicular to the line

$$3x - 4y - 7 = 0 \tag{2}$$

is:

(a) $(2, \frac{5}{2})$
(b) $(\pm 2, \frac{5}{2})$
(c) $(\frac{-1}{2}, \frac{5}{2})$
(d) $(\frac{1}{2}, \frac{5}{2}$

2. The points on the curve

$$\frac{x^2}{9} + \frac{y^2}{16} = 1 \tag{3}$$

at which the tangents are parallel to y-axis are:

(a) $(0, \pm 4)$
(b) $(\pm 4, 0)$
(c) $(\pm 3, 0)$
(d) $(0, \pm 3)$

3. For which value of m is the line

$$y = mx + 1 \tag{4}$$

a tangent to the curve

$$y^2 = 4x \tag{5}$$

(a) $\frac{1}{2}$
(b) 1
(c) 2
(d) 3