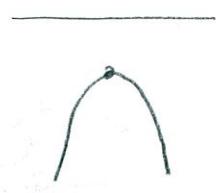


Find the equations of the following parabolas.

SCORE: \_\_\_\_ / 7 PTS

- [a] vertex at the origin, directrix  $y = 8$



$$x^2 = 4(-8)y$$

$$\underline{x^2 = -32y}$$

(1)      (1)

- [b] focus  $(7, 1)$ , directrix  $x = -6$



$$\text{VERTEX} = \left(\frac{7-6}{2}, 1\right) = \left(\frac{1}{2}, 1\right)$$

$$P = 7 - \frac{1}{2} = \frac{13}{2}$$

$$(y-1)^2 = 4\left(\frac{13}{2}\right)(x-\frac{1}{2})$$

$$\underline{(y-1)^2 = 26(x-\frac{1}{2})}$$

(1)      (1)

Write the formal definition of a parabola used in lecture.

SCORE: \_\_\_\_\_ / 2 PTS

A PARABOLA IS THE LOCUS OF POINTS IN THE PLANE  
WHOSE DISTANCES TO A FIXED POINT AND A FIXED LINE  
ARE EQUAL

Find the co-ordinates of the focus and vertex, and the equation of the directrix, of the parabola  $x^2 + 10x + 20y - 55 = 0$ .

SCORE: \_\_\_\_ / 5 PTS

$$\begin{aligned} x^2 + 10x &= -20y + 55 \\ \textcircled{1} \quad x^2 + 10x + 25 &= -20y + 80, \textcircled{1} \\ (x+5)^2 &= -20(y-4) \end{aligned}$$

$$4p = -20$$

$$p = -5 \quad \textcircled{1}$$

— D



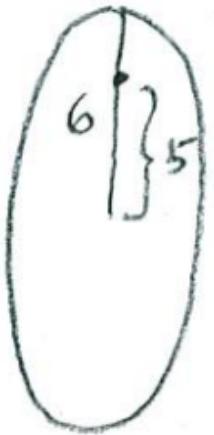
$$\begin{aligned} \text{VERTEX } &\underline{(-5, 4)} \quad \textcircled{2} \\ \text{FOCUS } &(-5, 4-5) \\ &= (-5, -1) \quad \textcircled{1} \end{aligned}$$

$$\begin{aligned} \text{DIRECTRIX } &y = 4+5 \\ &\underline{y = 9} \quad \textcircled{1} \end{aligned}$$

↑  
SUBTRACT  $\frac{1}{2}$  POINT  
IF YOU FORGOT  $y =$   
OR WROTE  $x =$   
INSTEAD

Find the equation of the ellipse with vertices  $(0, \pm 6)$  and foci  $(0, \pm 5)$ .

SCORE: \_\_\_\_\_ / 3 PTS



$$\frac{x^2}{11} + \frac{y^2}{36} = 1$$

The equation of the ellipse is shown in red. The denominator under  $x^2$  is circled with a red '1'. The denominator under  $y^2$  is circled with a red '1'. The right side of the equation is circled with a red  $\frac{1}{2}$ . A red arrow points from the center of the circled '1' under  $x^2$  to the center of the circled  $\frac{1}{2}$  on the right.

$$6^2 = b^2 + 5^2$$

$$36 = b^2 + 25$$

$$b^2 = 11$$

Find the co-ordinates of the vertices and foci of the ellipse  $\frac{x^2}{50} + \frac{y^2}{32} = 1$ .

SCORE: \_\_\_\_ / 3 PTS



$$50 = 32 + c^2$$

$$c^2 = 18$$

$$c = 3\sqrt{2}$$

↑ SHORT + FAT

VERTICES  $(\pm\sqrt{50}, 0) = (\pm 5\sqrt{2}, 0)$

FOCI  $(\pm 3\sqrt{2}, 0)$ , H<sub>2</sub> H<sub>1</sub>

SUBTRACT  $\frac{1}{2}$  POINT  
EACH ANSWER YOU FORGOT  $\pm$