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Quiz II

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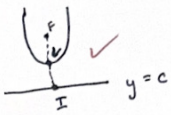
$Score = \frac{20}{20}$ ☺

QUESTION 1. (**7 points**) The equation of a parabola is $12(y+3) = (x-2)^2$.

(i) Roughly, sketch the parabola. (on the right hand side)



(ii) Find the focus and the vertex.

* vertex = (2, -3) ~~→ (center)~~

$12 = 4a \rightarrow d = \frac{12}{4} = 3$

∴ focus = (2, 0)

V = (2, -3)

F = (2, 0)

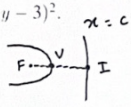
(iii) Find the directional line.

point I = (2, -6)

∴ directional line is $y = -6$

QUESTION 2. (**7 points**) The equation of a parabola is $-8(x-2) = (y-3)^2$.

(i) Roughly, sketch the parabola. (on the right hand side)



(ii) Find the focus and the vertex.

vertex; (2, 3) ~~→ (center)~~

$4d = -8 \rightarrow d = -2$

distance is 2.

∴ Focus is (0, 3)

V = (2, 3)

F = (0, 3)

(iii) Find the directional line.

point I is (4, 3)

hence directional line has an equation of $x = 4$ → $x = 4$

QUESTION 3. (**6 points**) The equation of a parabola is $y = x^2 - 6x + 7$.

(i) Write the equation of the form $4d(y - y_0) = (x - x_0)^2$.

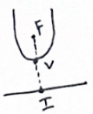
→ $y = x^2 - 6x + 7$ (completing the square). → $y = x^2 + bx + c$

~~→ $y - 7 + x^2 - 6x$~~ → $y = (x + \frac{b}{2})^2 + c - (\frac{b}{2})^2$

→ $y = (x-3)^2 + 7 - (-3)^2$

→ $y = (x-3)^2 - 2$ → $(y+2) = (x-3)^2$

$4d = 1 \rightarrow d = \frac{1}{4}$ or 0.25



(ii) Find the focus and the directional line.

~~center~~ vertex = (3, -2)

distance = 0.25

∴ Focus = (3, -1.75)

Point I = (3, -2.25) → hence directional line is $y = -2.25$