JAWABAN TUGAS KELOMPOK **R8**

MAT 1211 KALKULUS II SEMESTER GANJIL 2022/2023

Dosen:

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KELOMPOK 05

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Tugas Responsi

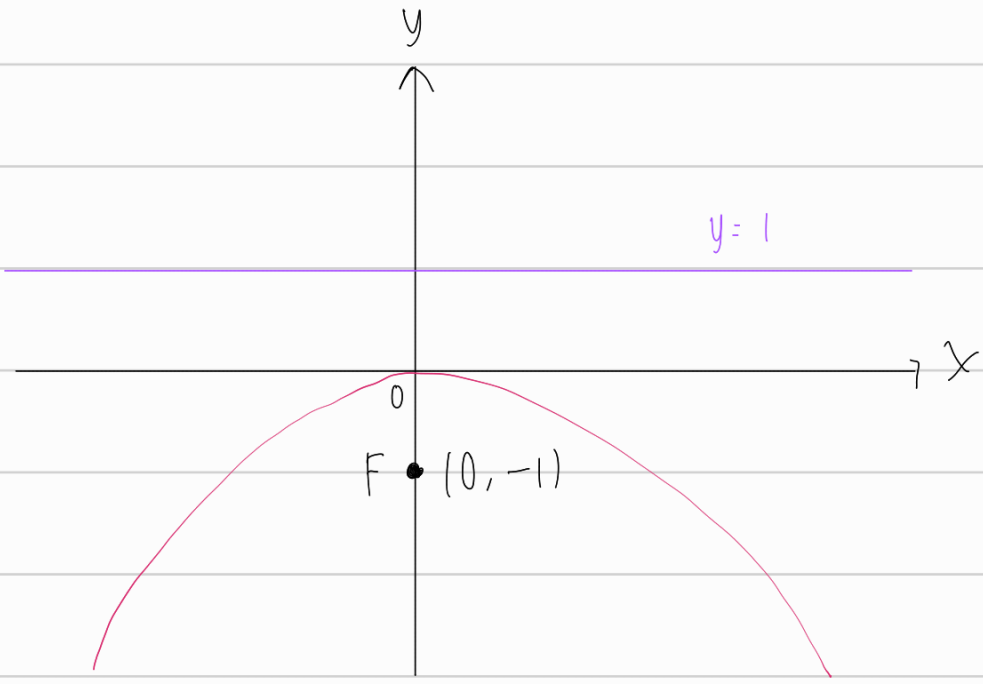
1.a) $4y + x^2 = 0$

$x^2 = -4y$

$x^2 = 4py$

$4p = -4$

$p = -1 \longrightarrow < 0 \rightarrow$ tipe b



Fokus = $(-1, 0)$

Titik puncak = $(0, 0)$

Direktriks = $y = -p$

$y = -(-1)$

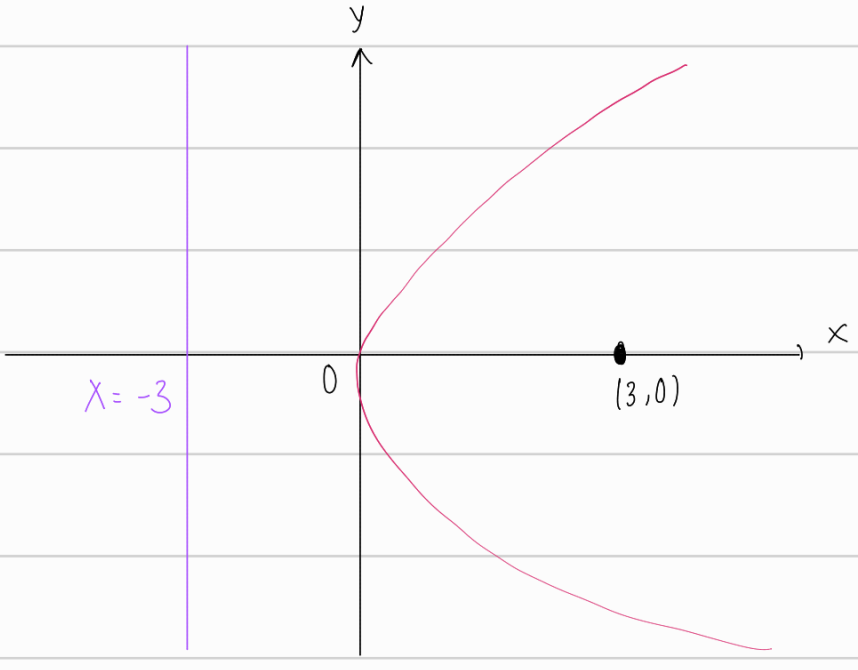
$y = 1$

1.b) $y^2 = 12x$

$y^2 = 4px$

$4p = 12$

$p = 3 \longrightarrow > 0 \rightarrow$ tipe c



Titik fokus = $(3, 0)$

Titik puncak = $(0, 0)$

Direktriks = $y = -p$

$y = -3$

2.a) $\frac{x^2}{64} + \frac{y^2}{100} = 1$

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

$a^2 = 100 \rightarrow a = 10$

$b^2 = 64 \rightarrow b = 8$

$c^2 = a^2 - b^2$

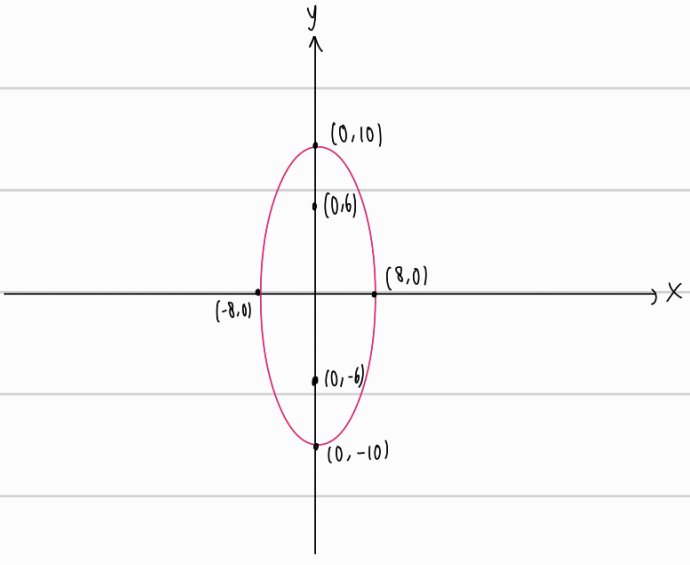
$c = \sqrt{100 - 64}$

$c = \sqrt{36} \rightarrow c = 6$

Titik fokus $= (0, \pm c) = (0, \pm 6)$

Titik puncak $= (0, \pm a) = (0, \pm 10)$

Keeksentrian $= e = \frac{c}{a} = \frac{6}{10} = \frac{3}{5}$



2.b) $25x^2 + 9y^2 = 225$

$\frac{25}{225}x^2 + \frac{9}{225}y^2 = 1$

$\frac{x^2}{9} + \frac{y^2}{25} = 1$

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

$a^2 = 25 \rightarrow a = 5$

$b^2 = 9 \rightarrow b = 3$

$c^2 = a^2 - b^2$

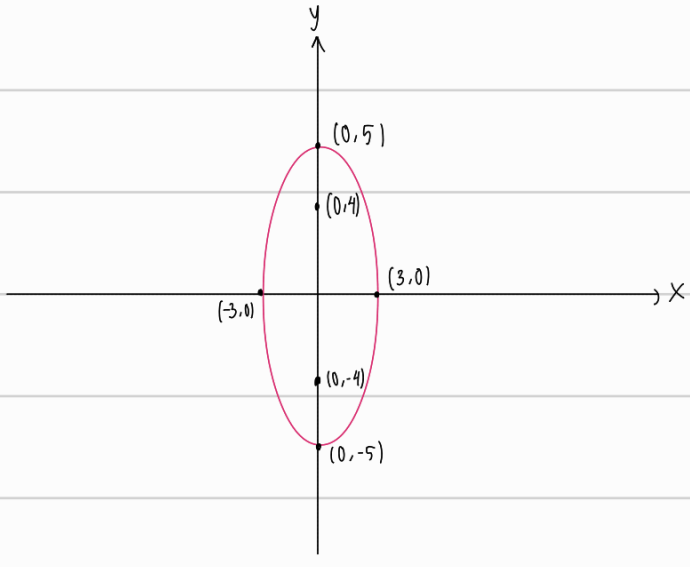
$c = \sqrt{25 - 9}$

$c = \sqrt{16} \rightarrow c = 4$

Titik fokus $= (0, \pm c) = (0, \pm 4)$

Titik puncak $= (0, \pm a) = (0, \pm 5)$

Keeksentrian $= e = \frac{c}{a} = \frac{4}{5}$



3.a) $\frac{x^2}{144} - \frac{y^2}{25} = 1$

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

$a^2 = 144 \rightarrow a = 12$

$b^2 = 25 \rightarrow b = 5$

$c^2 = a^2 + b^2$

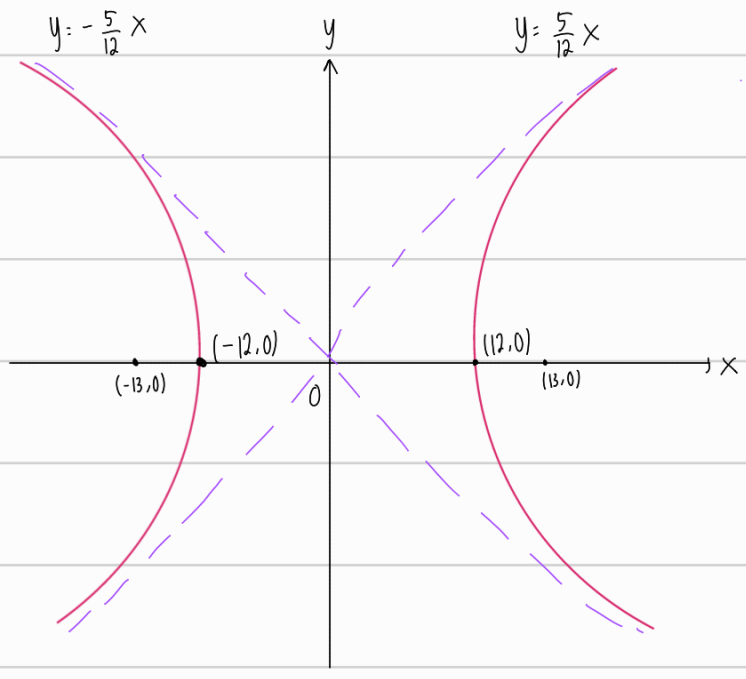
$c = \sqrt{144 + 25}$

$c = \sqrt{169} \rightarrow c = 13$

Titik fokus $= (\pm c, 0) = (\pm 13, 0)$

Titik puncak $= (\pm a, 0) = (\pm 12, 0)$

asimtot $y = \pm \left(\frac{b}{a}\right) x = \pm \left(\frac{5}{12}\right) x$



3.b) $9y^2 - x^2 = 9$

$\frac{y^2}{1} - \frac{x^2}{9} = 1$

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

$a^2 = 1 \rightarrow a = 1$

$b^2 = 9 \rightarrow b = 3$

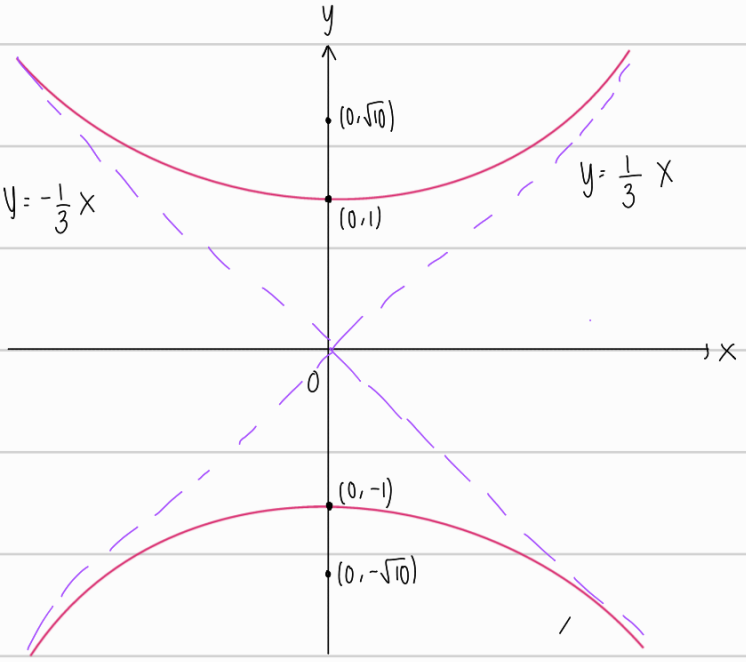
$c^2 = a^2 + b^2$

$c = \sqrt{1 + 9} = \sqrt{10} = 3.16$

Titik fokus $= (0, \pm c) = (0, \pm\sqrt{10})$

Titik puncak $= (0, \pm a) = (0, \pm 1)$

asimtot $y = \pm \left(\frac{a}{b}\right) x = \pm \left(\frac{1}{3}\right) x$



4.a) Parabola → titik puncak = (0,0)
→ titik fokus = (0,-2)

titik fokus parabola → (0, p)
↳ (0,-2)

$p = -2 \rightarrow < 0 \rightarrow$ tipe b → $x^2 = 4py$

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

$x^2 = -8y$

4.b) Parabola → titik fokus = (1,0)
→ direktriks $x = -1$

titik fokus parabola → (p, 0)
↳ (1, 0)

$p = 1 \rightarrow > 0 \rightarrow$ tipe c → $y^2 = 4px$

$y^2 = 4(1)x$

$y^2 = 4x$

5.a) Elips → titik fokus = $(\pm 2, 0)$
→ titik puncak = $(\pm 5, 0)$

titik fokus elipse = $(\pm c, 0)$ } $c = 2$
↳ $(\pm 2, 0)$

titik puncak elipse = $(\pm a, 0)$ } $a = 5$
↳ $(\pm 5, 0)$

$c^2 = a^2 - b^2$

$2^2 = 5^2 - b^2$

$4 = 25 - b^2$

$b^2 = 25 - 4$

$b = \sqrt{21}$

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

$\frac{x^2}{25} + \frac{y^2}{21} = 1$

6.a) Hiperbola → titik fokus = $(0, \pm 3)$
→ titik puncak = $(0, \pm 1)$

titik fokus = $(0, \pm c) \rightarrow (0, \pm 3) \rightarrow c = 3$

titik puncak = $(0, \pm a) \rightarrow (0, \pm 1) \rightarrow a = 1$

$c^2 = a^2 + b^2$

$3^2 = 1^2 + b^2$

$9 = 1 + b^2$

$8 = b^2$

$b = \sqrt{8}$

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

$\frac{y^2}{1} - \frac{x^2}{8} = 1$

$y^2 - \frac{x^2}{8} = 1$

6. b) Hiperbola → titik puncak : $(\pm 3, 0)$

→ garis asimtot $y = \pm 2x$

titik puncak hiperbola $\longrightarrow (\pm a, 0)$

$(\pm 3, 0)$

$\Big\} \; a = 3$

asimtot $y \rightarrow \pm \left(\frac{b}{a}\right) x$

$\pm 2x$

$\Big\} \; \frac{b}{a} = 2 \longrightarrow \frac{b}{3} = 2$

$b = 6$

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

$$\frac{x^2}{9} - \frac{y^2}{36} = 1$$