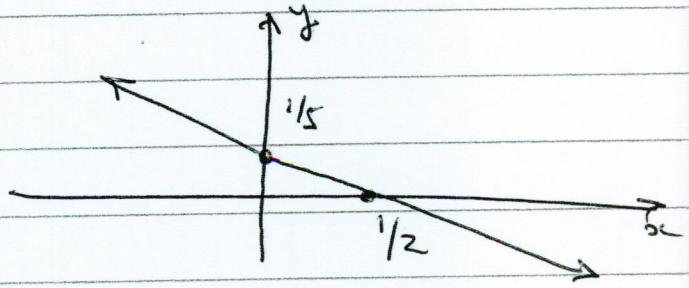
(8) (a) $2x+5y=1$ is linear in x, y and so is equation of a line. Intercepts are:

$x=0$: $y = 1/5$

$y=0$: $x = 1/2$



(b) $y = f(x) = x^2 - 2x + 3$ is a quadratic in x. So it's graph is a parabola. To find vertex find local min.

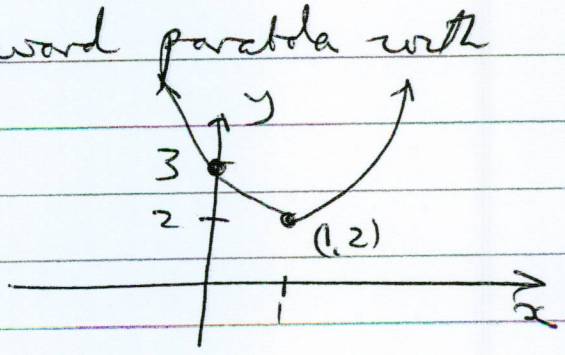
$$0 = f'(x) = 2x - 2 = 2(x-1)$$

So $x = 1$, $y = f(1) = 1^2 - 2\times 1 + 3 = 2$

Vertex at $(1, 2)$

y-intercept: $f(0) = 3$.

x-intercepts: None as upward parabola with vertex above x axis



(c) $y^2 - 9x^2 = 4$.

Hyperbola.

When $x=0$, $y^2 = 4$, $y = \pm 2$ $(0, \pm 2)$

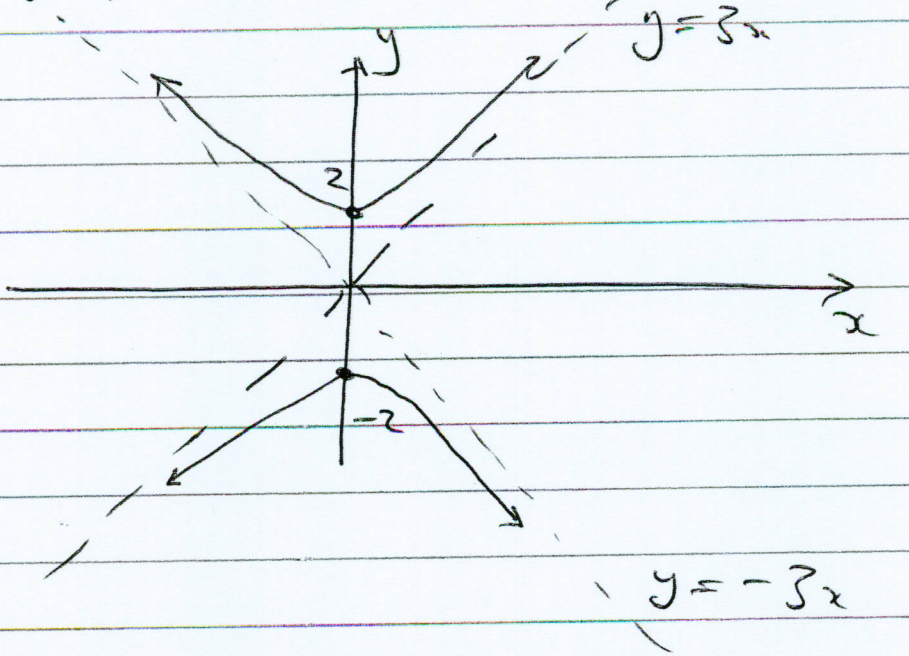
When $y=0$, $x^2 < 0$ NO SOLUTIONS

Asymptotes

$$y^2 - 9x^2 = 4$$
$$y^2 = 9x^2 + 4$$
$$\left(\frac{y}{x}\right)^2 = 9 + \frac{4}{x^2} \longrightarrow 9 \quad \text{as } x \to \pm\infty$$

So
$$y/x \to \pm 3 \quad \text{as } x \to \pm\infty$$
$$y \to \pm 3x \quad \text{as } x \to \pm\infty$$

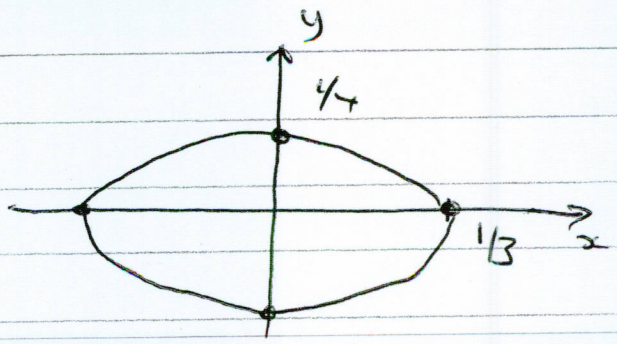
So Asymptotes are $y = \pm 3x$



(d)

$16y^2 + 9x^2 = 1$ Ellipse, Center (0, 0)

$$\left(\frac{y}{1/4}\right)^2 + \left(x/\tfrac{1}{3}\right)^2 = 1$$



Intercepts: $x = 0$, $y = \pm \frac{1}{4}$

$y = 0$, $x = \pm \frac{1}{3}$