

Write all responses on separate paper. Remember to organize your work clearly. You may *not* use your books, notes, or any calculator on this exam.

1. (21 points) Solve each equation for  $y$  by extracting roots:

(a)  $y^2 - 3 = 0$

(b)  $\left(y - \frac{1}{3}\right)^2 = \frac{1}{4}$

(c)  $(y - x)^2 = 5$

2. (21 points) Decide whether to solve by factoring or completing the square and then solve.

(a)  $(v - 6)(v + 11) = -30$

(b)  $x^2 + x - \frac{3}{4} = \frac{13}{36}$

(c)  $z(6z + 30) = (z - 15)^2$

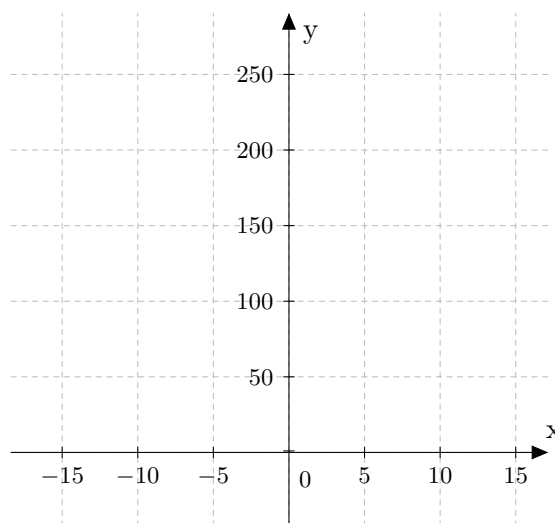
3. (29 points) Let  $y = 225 - x^2$ .

- (a) Find the coordinates of the  $x$ -intercepts of the graph.

- (b) Find the coordinates of the vertex of the graph.

- (c) Make a table of at least five  $(x, y)$  solutions and use these to graph the parabola.

- (d) Find the  $x$ -intercepts and vertex of  $y = 100 - \frac{4}{9}x^2$  and sketch its graph together with the graph of the other parabola. What do you notice?



4. (29 points) Let  $y = x^2 - 5x$

- (a) Find the coordinates of the  $x$ -intercepts of the graph.

- (b) Find the coordinates of the vertex of the graph.

- (c) Make a table of at least five  $(x, y)$  solutions and use these to graph the parabola.

- (d) Find the  $x$ -intercepts and vertex for  $y = \frac{1}{5}x^2 - 5x$  and sketch its graph together with the graph of the other parabola. Use the graph to estimate the coordinates where the two parabolas intersect.

