

1. The curve C has equation $y = x^2 - 4$ and the straight line l has equation $y + 3x = 0$.
- (a) In the space below, sketch C and l on the same axes. (3)
- (b) Write down the coordinates of the points at which C meets the coordinate axes. (2)
- (c) Using algebra, find the coordinates of the points at which l intersects C . (4)
- (Total 9 marks)**

2. Solve the simultaneous equations
- $$y = x - 2,$$
- $$y^2 + x^2 = 10.$$
- (Total 7 marks)**

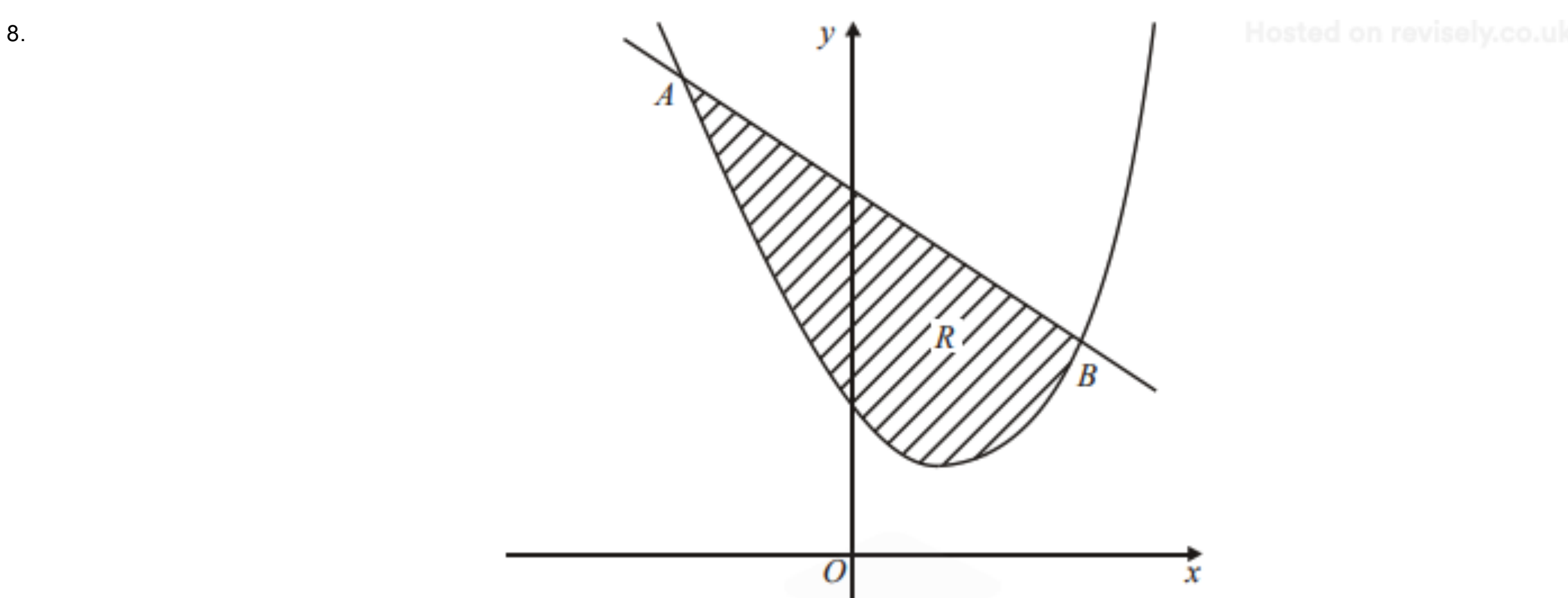
3. (a) By eliminating y from the equations
- $$y = x - 4,$$
- $$2x^2 - xy = 8,$$
- show that
- $$x^2 + 4x - 8 = 0.$$
- (b) Hence, or otherwise, solve the simultaneous equations
- $$y = x - 4,$$
- $$2x^2 - xy = 8,$$
- giving your answers in the form $a \pm b\sqrt{3}$, where a and b are integers. (5)
- (Total 7 marks)**

4. Solve the simultaneous equations
- $$x + y = 3,$$
- $$x^2 + y = 15.$$
- (Total 6 marks)**

5. Solve the simultaneous equations
- $$x - 2y = 1,$$
- $$x^2 + y^2 = 29.$$
- (Total 6 marks)**

6. Solve the simultaneous equations
- $$y - 3x + 2 = 0$$
- $$y^2 - x - 6x^2 = 0$$
- (Total 7 marks)**

7. (a) Given that $3^x = 9^y - 1$, show that $x = 2y - 2$. (2)
- (b) Solve the simultaneous equations
- $$x = 2y - 2,$$
- $$x^2 = y^2 + 7.$$
- (Total 8 marks)**

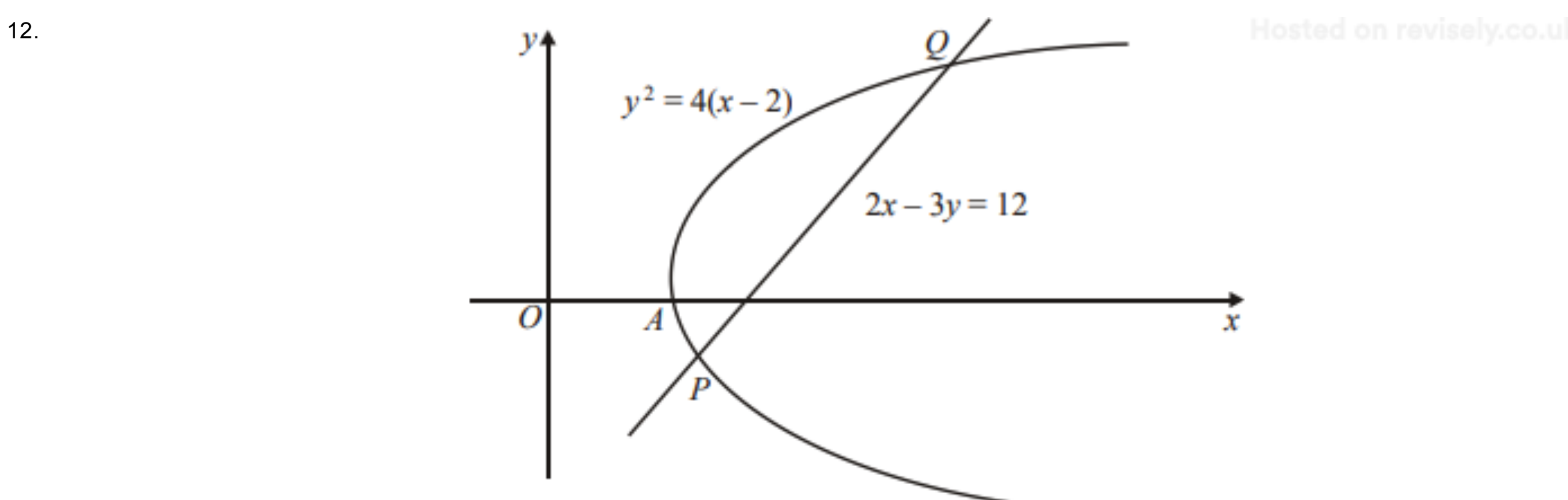


- The diagram above shows the line with equation $y = 9 - x$ and the curve with equation $y = x^2 - 2x + 3$. The line and the curve intersect at the points A and B , and O is the origin.
- (a) Calculate the coordinates of A and the coordinates of B . (5)
- The shaded region R is bounded by the line and the curve.
- (b) Calculate the area of R . (7)
- (Total 12 marks)**

9. Solve the simultaneous equations
- $$x + y = 2$$
- $$x^2 + 2y = 12.$$
- (Total 6 marks)**

10. (a) Show that eliminating y from the equations
- $$2x + y = 8,$$
- $$3x^2 + xy = 1$$
- produces the equation
- $$x^2 + 8x - 1 = 0.$$
- (b) Hence solve the simultaneous equations
- $$2x + y = 8,$$
- $$3x^2 + xy = 1$$
- giving your answers in the form $a + b\sqrt{17}$, where a and b are integers. (5)
- (Total 7 marks)**

11. Solve the simultaneous equations
- $$x - 3y + 1 = 0,$$
- $$x^2 - 3xy + y^2 = 11.$$
- (Total 7 marks)**



- The diagram above shows the curve with equation $y^2 = 4(x - 2)$ and the line with equation $2x - 3y = 12$.
- The curve crosses the x -axis at the point A , and the line intersects the curve at the points P and Q .
- (a) Write down the coordinates of A . (1)
- (b) Find, using algebra, the coordinates of P and Q . (6)
- (c) Show that $\angle PAQ$ is a right angle. (4)
- (Total 11 marks)**