

## Quadratic Simultaneous Equations Exam Practice



Q1. Solve the simultaneous equations:

$$x^2 + y^2 = 17$$

$$2x + y = 2$$

(5 marks)

Q2. Solve the simultaneous equations:

$$x^2 + y^2 = 97$$

$$3y + 5x = 33$$

(5 marks)

Q3. Solve the simultaneous equations:

$$2x^2 + y^2 = 59$$

$$3x + 7y = 36$$

(5 marks)

Q4. Find all the solutions to the pair of simultaneous equations:

$$y^2 - 4x = 13$$

$$y - 2x = -1$$

(6 marks)

Q5. Find all the solutions to the pair of simultaneous equations:

$$x^2 - 2x = y + 7$$

$$y - x = 3$$

(6 marks)

Q6. Solve the simultaneous equations:

$$3s + t = 8$$

$$3s^2 + t^2 = 28$$

(5 marks)

Q7. Solve the simultaneous equations:

$$s + 2t = 3$$

$$3st + s^2 = 10$$

(6 marks)



## Applied Mixed Practice Problems

Q8. Given the pair of simultaneous questions

$$a + 4b = 2$$

$$3b^2 + ab = -11$$

a) show that  $b^2 - 2a - 11 = 0$

(2 marks)

b) hence solve the pair of simultaneous equations

(3 marks)

Q9. Sandy throws a ball in a sport-hall.

- The height  $h$  of the ball in metres can be modelled by the quadratic equation,  $h = -0.05x(x - 32)$ , where  $x$  is the horizontal distance travelled.
- The roof of the sports-hall can be modelled by the linear equation,  $y - 0.15x - 8 = 0$ .

a) Show that the model predicts that the ball hits the roof of the sports-hall.

(4 marks)

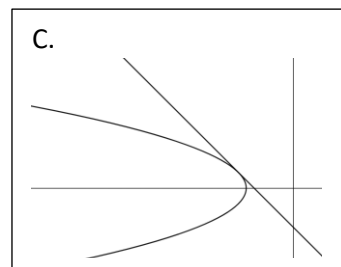
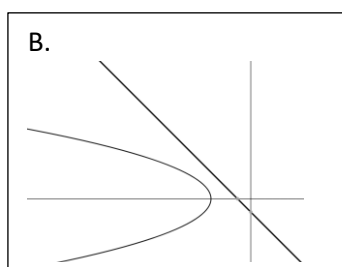
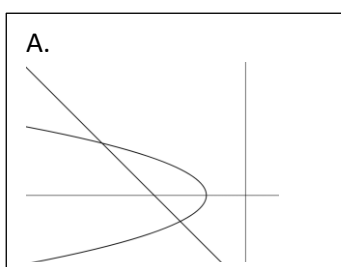
b) State the horizontal distance from Sandy to the point directly below the roof of the point of contact. Give your answer to 1 decimal place.

(2 marks)

Q10. A curve has equation,  $y^2 + 2x + 6 = 0$  and a line has equation  $y + x + 7 = 0$ .

a) Find the co-ordinates of any points where the line and the curve meet.  
(5 marks)

b) Which of these diagrams below represent the curve and the line?  
You must explain your choice.



(1 mark)

Q11. Solve the pair of simultaneous equations  $y + 4x = 2$  and  $3x^2 + xy = 11$ .  
Give your answer in the form  $a + b\sqrt{3}$  where  $a, b$  are whole numbers.

(5 marks)