Simultaneous Equations

How to . . .

Most recent exam questions involving simultaneous equations haven't been this tough!

Solve the simultaneous equations

$x^2 + y^2 = 9$ — (1)

$x + y = 2$ — (2)

Give your answers correct to 2 decimal places.

from (1) $y = 2 - x$ — (3)

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

Substituting into (1)

$x^2 + 4 - 4x + x^2 = 9$

$2x^2 - 4x + 4 - 9 = 0$

$2x^2 - 4x - 5 = 0$

Using the quadratic formula (in the front of the exam!)

$a = 2$, $b = -4$, $c = -5$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{4 \pm \sqrt{16 - 4 \times 2 \times -5}}{4}$

$= \frac{4 \pm \sqrt{56}}{4}$

$x = \frac{4 + \sqrt{56}}{4} = 2.870828693$

sub into (3)

$y = -0.8708286934$

$x = \frac{4 - \sqrt{56}}{4} = -0.8708286934$

$y = 2.870828693$

$x = 2.87$ $y = -0.87$

$x = -0.87$ $y = 2.87$

(6)

Now have a go yourself . . .

SORTED IT – solve by elimination

a) $4x - y = 3$, $x + y = 7$

b) $2x + y = 9$, $x + y = 5$

c) $x + 4y = 6$, $3x - 2y = -4$

d) $x + 2y = 9$, $y = x + 3$

NAILED IT - solve by substitution

a) $x^2 + 2y = 1$, $y = x - 1$

b) $x^2 + y = 6$, $y = x$

c) $x^2 - 2y = 2$, $y = x + 3$

d) $x^2 + 4y = 7$, $2y + x = 2$

MASTERED IT

a) $x^2 + y^2 = 25$, $Y = x + 1$

b) $x^2 + y^2 = 16$, $y = x - 1$

c) $x^2 + y^2 = 20$, $y = x + 4$

d) $x^2 + y^2 = 100$, $y = 1 + 3x$

These are tough!! ... Give your answer correct to 3 significant figures.

Exam Questions

Q1. Solve the following simultaneous equations. Give your answers correct to 3 significant figures

$$x^2 + y^2 = 19$$

$$y = x + 5$$

Q2. Solve the following simultaneous equations. Give your answers correct to 3 significant figures

$$x^2 + y^2 = 45$$

$$y = 6 + 2x$$

Ready to be marked ?

Checklist

- ☐ Answer checked
- ☐ Working out shown

Keywords

Things to remember …

What went well …

Teacher comment ..