Simultaneous Equations: Advanced

Video 298 on www.corbettmaths.com

Examples

Workout

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Question 1: Solve the following simultaneous equations

(a) $y = x + 3$
$y = x^2 + 5x - 2$

(b) $y = x^2 + x - 14$
$y = x - 5$

(c) $y = 2x - 1$
$y = x^2 - 2x + 2$

(d) $y = 2x^2 + 9x + 1$
$y = 3x + 9$

(e) $y = 2x^2 + x + 1$
$y = x^2 - 5x - 7$

(f) $y = -x^2 + 5x + 2$
$y = 3x^2 - x - 2$

Question 2: Solve the following simultaneous equations

(a) $x + y = 4$
$y = x^2 + 3x - 1$

(b) $x + y = 7$
$xy = 10$

(c) $x^2 + y^2 = 13$
$x + y = 5$

(d) $2x - y + 4 = 0$
$y = x^2 + x - 2$

(e) $x^2 + y^2 = 29$
$7 + x + y = 0$

(f) $xy = -6$
$x + 2y = -4$

(g) $y = x^2 - 3x + 3$
$y = 10x - 39$

(h) $x^2 + y^2 = 1$
$x + 2y = 1$

(i) $5x + y = 5$
$2x^2 - 9x - y = 11$

(j) $y = 9x^2 + 11x + 3$
$5x - y + 2 = 0$

(k) $2x + y = 5$
$2x^2 + y^2 = 11$

(l) $x - 4y + 1 = 0$
$x^2 - 4xy + y^2 = 13$

Question 3: Solve the following simultaneous equations

(a) $2x + y = 7$
$x^2 - y^2 = 8$

(b) $x^2 + y^2 = 20$
$y = x + 3$

(c) $y = x^2 - 9x - 3$
$y = x$

(d) $2x^2 + y^2 = 10$
$2x - y = 5$

(e) $y = x^2 + x - 7$
$4x + 2y + 1 = 0$

(f) $y = x - 2$
$2x^2 - xy = 11$

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Apply

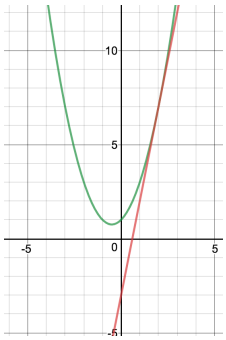
Question 1: Find the coordinates where the line $x + y = 3$ and the curve $x^2 + 3y = 27$ intersect

Question 2: How many points of intersection does the curve $y = (x - 3)(x + 4)$ have with the line $y = x - 8$?

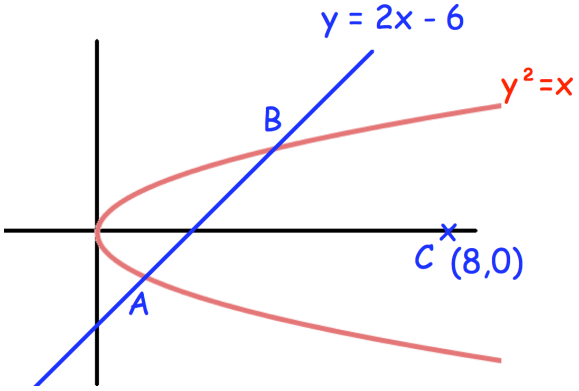
Question 3: The line $y = x + 4$ and the curve $y = x^2 + 3x + 4$ intersect at the points A and B. Find the distance between the points A and B.

Question 4: Find the coordinates of the points where the line $x + 5y = 37$ and the curve $y = x^2 + x + 2$ meet.

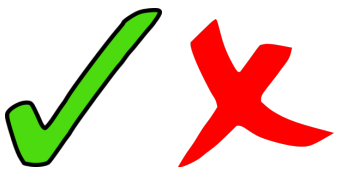
Question 5: Show, by using simultaneous equations, that the line $y = 5x - 3$ is a tangent to the curve $y = x^2 + x + 1$



Question 6: Shown below is the curve $y^2 = x$ and the line $y = 2x - 6$
The curve and the line meet at the points A and B
The point C is (8, 0)
Show ABC is a right angled triangle.



Answers



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