Assignment

Complete pgs. 451 - 452
Questions 2, 3de, 4abe

You do not have to verify #3

Solutions

2. Verify that $\left(\frac{1}{3}, \frac{3}{4}\right)$ is a solution to the following system of equations.

$18w^2 - 16z^2 = -7$
$144w^2 + 48z^2 = 43$

L.S	R.S.	L.S.	R.S.
$18w^2 - 16z^2$	-7	$144w^2 + 48z^2$	43
$18\left(\frac{1}{3}\right)^2 - 16\left(\frac{3}{4}\right)^2$		$144\left(\frac{1}{3}\right)^2 + 48\left(\frac{3}{4}\right)^2$	
$18\left(\frac{1}{9}\right) - 16\left(\frac{9}{16}\right)$		$144\left(\frac{1}{9}\right) + 48\left(\frac{9}{16}\right)$	
$\frac{18}{9} - \frac{144}{16}$		$\frac{144}{9} + \frac{432}{16}$	
$2 - 9$		$16 + 27$	
-7		43	
* L.S = R.S.		* L.S = R.S.	

$\Rightarrow$ $\left(\frac{1}{3}, \frac{3}{4}\right)$ is a solution to the given system of equations.

Solutions

3. Solve each system of equations by substitution.

d) $3x^2+4x-y-8=0$ ①
$y+3=2x^2+4x$ ②

② $y+3=2x^2+4x$
$y=2x^2+4x-3$ sub. in ①

① $3x^2+4x-y-8=0$
$3x^2+4x-(2x^2+4x-3)-8=0$
$3x^2+4x-2x^2-4x+3-8=0$
$3x^2-2x^2+4x-4x+3-8=0$
$x^2-5=0$
$x^2=5$
$x=\pm\sqrt{5}$ sub. in ②

When $x=\sqrt{5}$:

② $y+3=2x^2+4x$
$y+3=2(\sqrt{5})^2+4(\sqrt{5})$
$y+3=2(5)+4\sqrt{5}$
$y=10+4\sqrt{5}-3$
$y=7+4\sqrt{5}$

$(\sqrt{5}, 7+4\sqrt{5})$
OR
$(2.24, 15.94)$

When $x=-\sqrt{5}$:

$y+3=2x^2+4x$
$y+3=2(-\sqrt{5})^2+4(-\sqrt{5})$
$y+3=2(5)-4\sqrt{5}$
$y=10-4\sqrt{5}-3$
$y=7-4\sqrt{5}$

$(-\sqrt{5}, 7-4\sqrt{5})$
OR
$(-2.24, -1.94)$

Solutions

e) $y + 2x = x^2 - 6$ ①
$x + y - 3 = 2x^2$ ②

① $y + 2x = x^2 - 6$
$y = x^2 - 2x - 6$ sub. in ②

② $x + y - 3 = 2x^2$
$x + (x^2 - 2x - 6) - 3 = 2x^2$
$x + x^2 - 2x - 6 - 3 = 2x^2$
$x^2 - 1x - 9 = 2x^2$
$0 = 2x^2 - x^2 + 1x + 9$
$0 = x^2 + 1x + 9$
$a = 1,\ b = 1,\ c = 9$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$x = \frac{-1 \pm \sqrt{(1)^2 - 4(1)(9)}}{2(1)}$$
$$x = \frac{-1 \pm \sqrt{1 - 36}}{2}$$
$$x = \frac{-1 \pm \sqrt{-35}}{2}$$

* NO SOLUTION!

Solutions

4. Solve each system of equations by elimination.

a) $6x^2 - 3x = 2y - 5$ ①
$2x^2 + x = y - 4$ ②

Multiply ② by -2
$-4x^2 - 2x = -2y + 8$ ③
$6x^2 - 3x = 2y - 5$ ①

Add ③ + ①
$2x^2 - 5x = 3$
$2x^2 - 5x - 3 = 0$
$(x + \frac{1}{2})(x - \frac{6}{2})$

$\frac{1}{\ } \times \frac{-6}{\ } = -6$
$\frac{1}{\ } + \frac{-6}{\ } = -5$

$(2x+1)(x-3) = 0$
$2x + 1 = 0$ or $x - 3 = 0$
$\frac{\cancel{2}x}{\cancel{2}} = \frac{-1}{2}$ $x = 3.$
$x = -\frac{1}{2}$

Sub in ②

When $x = -\frac{1}{2}$:

$2x^2 + x = y - 4$
$2\left(-\frac{1}{2}\right)^2 + \left(-\frac{1}{2}\right) = y - 4$
$2\left(\frac{1}{4}\right) - \frac{1}{2} = y - 4$
$\frac{2}{4} - \frac{1}{2} = y - 4$
$\frac{1}{2} - \frac{1}{2} = y - 4$
$0 = y - 4$
$4 = y$

When $x = 3$:

$2x^2 + x = y - 4$
$2(3)^2 + (3) = y - 4$
$2(9) + 3 = y - 4$
$18 + 3 = y - 4$
$21 = y - 4$
$21 + 4 = y$
$25 = y$

Solutions: $(-\frac{1}{2}, 4)$ & $(3, 25)$

Solutions

b) $x^2 + y = 8x + 19$ ①
$x^2 - y = 7x - 11$ ②

Add ① and ②
$2x^2 = 15x + 8$
$2x^2 - 15x - 8 = 0$
$(x + \frac{1}{2})(x - \frac{16}{2})$

$\frac{1}{2} \times \frac{-16}{2} = -16$
$\frac{1}{2} + \frac{-16}{2} = -15$

$(2x + 1)(x - 8) = 0$
$2x + 1 = 0$ or $x - 8 = 0$
$\frac{2x}{2} = \frac{-1}{2}$ $x = 8$
$x = \frac{-1}{2}$

Sub. in ①

When $x = -\frac{1}{2}$:

$x^2 + y = 8x + 19$
$\left(\frac{-1}{2}\right)^2 + y = 8\left(\frac{-1}{2}\right) + 19$
$\frac{1}{4} + y = \frac{-8}{2} + 19$
$y = -4 + 19 - \frac{1}{4}$
$y = 15 - \frac{1}{4}$
$y = \frac{60}{4} - \frac{1}{4}$
$y = \frac{59}{4}$ or 14.75

When $x = 8$:

$x^2 + y = 8x + 19$
$(8)^2 + y = 8(8) + 19$
$64 + y = 64 + 19$
$y = 64 + 19 - 64$
$y = 19$

Solutions: $(-1/2, 59/4)$ & $(8, 19)$
-0.5 14.75

Solutions

e) $4h^2 - 8t = 6$ ①
$6h^2 - 9 = 12t$ ②

Multiply ① x3
$12h^2 - 24t = 18$ ③
$12h^2 - 24t - 18 = 0$

Multiply ② x2
$12h^2 - 18 = 24t$ ④
$12h^2 - 24t - 18 = 0$

* Since both equations are the same, they have an infinite number of solutions.