Chapter 8

Chapter 8 REVIEW

Assignment

Complete pgs. 457 - 458

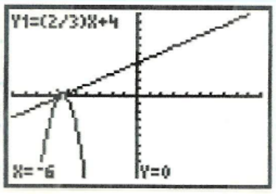
Questions 3, 8, 9, 10a, & 11

Solutions

3. Solve each system of equations by graphing.

a) $y = \frac{2}{3}x + 4$

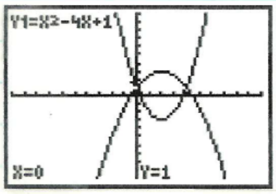
$y = -3(x+6)^2$

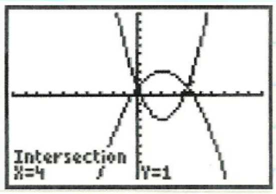


SOLUTION: $(-6, 0)$

b) $y = x^2 - 4x + 1$

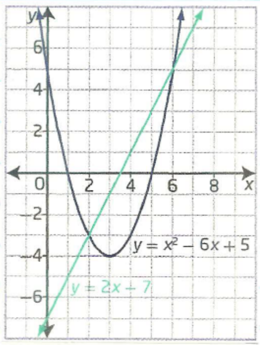
$y = -\frac{1}{2}(x-2)^2 + 3$





SOLUTIONS: $(0, 1)$ and $(4, 1)$

8.



a) Estimate the solutions to the system of equations shown in the graph.

SOLUTIONS: $(2, -3)$ & $(6, 5)$

Solutions

b) Solve the system algebraically.

$y = 2x - 7$ ①
$y = x^2 - 6x + 5$ ②

① $y = 2x - 7$ sub. in ②

② $y = x^2 - 6x + 5$
$2x - 7 = x^2 - 6x + 5$
$0 = x^2 - 6x - 2x + 5 + 7$
$0 = x^2 - 8x + 12$
$0 = (x-6)(x-2)$
$x - 6 = 0$ or $x - 2 = 0$
$x = 6$ $\quad x = 2$ sub. in ①

When $x = 6$:
① $y = 2x - 7$
$y = 2(6) - 7$
$y = 12 - 7$
$y = 5$

When $x = 2$:
$y = 2x - 7$
$y = 2(2) - 7$
$y = 4 - 7$
$y = -3$

SOLUTIONS: $(6,5)$ and $(2,-3)$
* SAME AS PART A

Solutions

9. Without solving the system $4m^2-3n=-2$ and $m^2+\frac{7}{2}m+5n=7$, determine which solution is correct: $\left(\frac{1}{2}, 1\right)$ or $\left(\frac{1}{2}, -1\right)$.

$\Rightarrow \left(\frac{1}{2}, 1\right)$ (m, n)

L.S.	R.S.
$4m^2-3n$	-2
$4\left(\frac{1}{2}\right)^2-3(1)$	
$4\left(\frac{1}{4}\right)-3$	
$\frac{4}{4}-3$	
$1-3$	
-2	

L.S = R.S. ✓

L.S.	R.S.
$m^2+\frac{7}{2}m+5n$	$7.$
$\left(\frac{1}{2}\right)^2+\frac{7}{2}\left(\frac{1}{2}\right)+5(1)$	
$\frac{1}{4}+\frac{7}{4}+5$	
$\frac{8}{4}+5$	
$2+5$	
7	

L.S. = R.S. ✓

Solutions

$\Rightarrow \left(\frac{1}{2}, -1\right)$ with $m = \frac{1}{2}$, $n = -1$

L.S.	R.S.
$4m^2 - 3n$	-2
$4\left(\frac{1}{2}\right)^2 - 3(-1)$	
$4\left(\frac{1}{4}\right) + 3$	
$\frac{4}{4} + 3$	
$1 + 3$	
$4.$	

L.S $\neq$ R.S. x

L.S.	R.S.
$m^2 + \frac{7}{2}m + 5n$	7
$\left(\frac{1}{2}\right)^2 + \frac{7}{2}\left(\frac{1}{2}\right) + 5(-1)$	
$\frac{1}{4} + \frac{7}{4} - 5$	
$\frac{8}{4} - 5$	
$2 - 5$	
-3	

L.S $\neq$ R.S. x

* SOLUTION: $\left(\frac{1}{2}, 1\right)$

Solutions

10. Solve each system algebraically giving exact answers. Explain why you chose the method you used.

a) $p = 3K + 1$ ①
$p = 6K^2 + 10K - 4$ ②

① $p = 3K + 1$ sub. in ②

② $p = 6K^2 + 10K - 4$
$3K + 1 = 6K^2 + 10K - 4$
$0 = 6K^2 + 10K - 3K - 4 - 1$
$0 = 6K^2 + 7K - 5$ {Decomposition or Quad. Form.}
$a = 6, b = 7, c = -5$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$x = \frac{-7 \pm \sqrt{(7)^2 - 4(6)(-5)}}{2(6)}$$
$$x = \frac{-7 \pm \sqrt{49 + 120}}{12}$$
$$x = \frac{-7 \pm \sqrt{169}}{12}$$
$$x = \frac{-7 \pm 13}{12}$$
$$x = \frac{-7 + 13}{12} \quad \text{or} \quad x = \frac{-7 - 13}{12}$$
$$x = \frac{6}{12} \qquad x = -\frac{20}{12}$$
$$x = \frac{1}{2} \qquad x = \frac{-5}{3} \quad \text{sub. in ①.}$$
$$\Rightarrow K = \frac{1}{2} \qquad \Rightarrow K = \frac{-5}{3}$$

When $K = \frac{1}{2}$:

① $p = 3K + 1$
$p = 3\left(\frac{1}{2}\right) + 1$
$p = \frac{3}{2} + 1$
$p = \frac{3}{2} + \frac{2}{2}$
$p = \frac{5}{2}$

When $K = \frac{-5}{3}$:

$p = 3K + 1$
$p = 3\left(\frac{-5}{3}\right) + 1$
$p = \frac{-15}{3} + 1$
$p = -5 + 1$
$p = -4$

* SOLUTIONS: $\left(\frac{1}{2}, \frac{5}{2}\right)$ and $\left(\frac{-5}{3}, -4\right)$.

Solutions

11. The approximate height, h, in meters, travelled by golf balls hit with two different clubs over a horizontal distance of d meters is given by the following functions:

seven-iron: $h(d) = -0.002d^2 + 0.3d$
nine-iron: $h(d) = -0.004d^2 + 0.5d$

a) At what distances is the ball at the same height when either of the clubs is used?

$h = -0.002d^2 + 0.3d$ ①
$h = -0.004d^2 + 0.5d$ ②

① $h = -0.002d^2 + 0.3d$ sub. in ②

② $-0.002d^2 + 0.3d = -0.004d^2 + 0.5d$

$$-0.002d^2 + 0.004d^2 + 0.3d - 0.5d = 0$$
$$0.002d^2 - 0.2d = 0$$
$$d(0.002d - 0.2) = 0$$
$$d = 0 \text{ or } 0.002d - 0.2 = 0$$
$$\frac{\cancel{0.002}d}{\cancel{0.002}} = \frac{0.2}{0.002}$$
$$d = 100$$

The ball is at the same height when the distance is 0m (before it is hit) and when it is 100m.

Solutions

b) What is this height?

When $d=0$:

$h=-0.002d^2+0.3d$

$h=-0.002(0)^2+0.3(0)$

$h=0+0$

$h=0$

When $d=100$:

$h=-0.002d^2+0.3d$

$h=-0.002(100)^2+0.3(100)$

$h=-0.002(10\,000)+30$

$h=-20+30$

$h=10$

The ball reaches a height of 0 m when the distance is also 0 m and the ball reaches a height of 10 m when the distance is 100 m.

$\Rightarrow (0,0)$ and $(100,10)$