Chapter 8
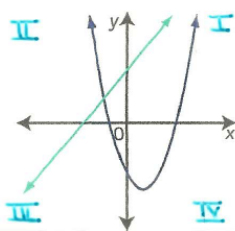
Chapter 8
PRACTICE TEST

Assignment

Complete page 459

Questions 1, 3, 4, 5, 6, 7

Solutions

1. The graph for a system of equations is shown. In which quadrant(s) is there a solution to the system?

II   I

III   IV

If extended, this line and parabola will also intersect in Quadrant I.

BEST SOLUTION: C
↳ I and II only.

3. Tables of values are shown for two different quadratic functions. What conclusion can you make about the related system of equations?

x	y
1	6
2	−3
3	−6
4	−3
5	6

x	y
1	−6
2	−3
3	−2
4	−3
5	−6

SOLUTION: B
↳ It has at least two real solutions.

Solutions

4. What is the solution to the following system of equations?

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

① $y = (x+2)^2 - 2$ Sub. in②

② $y = \frac{1}{2}(x+2)^2$

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

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

$$x^2 + 2x + 2x + 4 - 2 = \frac{1}{2}(x^2 + 2x + 2x + 4)$$

$$x^2 + 4x + 2 = \frac{1}{2}(x^2 + 4x + 4)$$

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

$$2x^2 + 8x + 4 = x^2 + 4x + 4$$

$$2x^2 - x^2 + 8x - 4x + 4 - 4 = 0$$

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

$$x(x + 4 = 0$$

$$\boxed{x = 0} \text{ or } x + 4 = 0$$

$$\boxed{x = -4}$$

SOLUTION: D

↳ $x = -4$ and $x = 0$.

Solutions

5. Connor used the substition method to solve the system
$$5m - 2n = 25$$
$$3m^2 - m + n = 10$$

Below is Connor's solution for m. In which line did he make an error?

Connor's Solution:

Solve the second equation for n:
$$n = 10 - 3m^2 + m \qquad\qquad \text{line 1}$$

Substitute into the first equation:
$$5m - 2(10 - 3m^2 + m) = 25 \qquad \text{line 2}$$
$$5m - 20 + 6m^2 - 2m = 25$$
$$6m^2 + 3m - 45 = 0 \qquad\qquad \text{line 3}$$
$$2m^2 + m - 15 = 0$$
$$(2m + 5)(m - 3) = 0 \qquad\qquad \text{line 4}$$
$$m = 2.5 \quad \text{or} \quad m = -3$$

SOLUTION: D
↳ line 4 {should be $(2m-5)(m+3)$}

Solutions

6. A student determines that one solution to a system of quadratic-quadratic equations is $(2,1)$. What is the value of n if the equations are

$$4x^2 - my = 10$$
$$mx^2 + ny = 20$$

$\Rightarrow$ $4(2)^2 - m(1) = 10$
$4(4) - 1m = 10$
$16 - 1m = 10$
$16 - 10 = 1m$
$6 = 1m$
$\boxed{6 = m}$

$\Rightarrow$ $m(2)^2 + n(1) = 20$
$m(4) + 1n = 20$
$4m + 1n = 20$
$4(6) + 1n = 20$
$24 + 1n = 20$
$1n = 20 - 24$
$1n = -4$
$\boxed{n = -4}$

Solutions

7. Solve algebraically.

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

$5x^2 + x + 3y + 3 = 0$ ①
$2x^2 - x + 2y + 4 = 0$ ②

Multiply ① x2 and ② x3

$10x^2 + 2x + 6y + 6 = 0$
$6x^2 - 3x + 6y + 12 = 0$

① - ②
$4x^2 + 5x - 6 = 0$ {Decomposition or Quad. Form.}
$a = 4, b = 5, c = -6$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \dfrac{-5 \pm \sqrt{(5)^2 - 4(4)(-6)}}{2(4)}$

$x = \dfrac{-5 \pm \sqrt{25 + 96}}{8}$

$x = \dfrac{-5 \pm \sqrt{121}}{8}$

$x = \dfrac{-5 \pm 11}{8}$

$x = \dfrac{-5 + 11}{8}$ or $x = \dfrac{-5 - 11}{8}$

$x = \dfrac{6}{8}$ $x = \dfrac{-16}{8}$

$x = \dfrac{3}{4}$ $x = -2$ Sub. in ①

precal11ch8PracticeTest.notebook

Solutions

When $x = \dfrac{3}{4}$:

① $5x^2 + 3y = -3 - x$

$5\left(\dfrac{3}{4}\right)^2 + 3y = -3 - \dfrac{3}{4}$

$5\left(\dfrac{9}{16}\right) + 3y = \dfrac{-3}{1} - \dfrac{3}{4}$

$\dfrac{45}{16} + 3y = \dfrac{-48}{16} - \dfrac{12}{16}$

$3y = \dfrac{-48}{16} - \dfrac{12}{16} - \dfrac{45}{16}$

$3y = \dfrac{-105}{16}$

$\dfrac{48y}{48} = \dfrac{-105}{48}$

$y = \dfrac{-35}{16}$

When $x = -2$:

① $5x^2 + 3y = -3 - x$

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

$5(4) + 3y = -3 + 2$

$20 + 3y = -1$

$3y = -1 - 20$

$\dfrac{3y}{3} = \dfrac{-21}{3}$

$y = -7$

✳ SOLUTIONS: $\left(\dfrac{3}{4}, \dfrac{-35}{16}\right)$ and $(-2, -7)$.

Solutions

b) $y = 7x - 11$ ①
$5x^2 - 3x - y = 6$ ②

① $y = 7x - 11$ sub. in ②

② $5x^2 - 3x - y = 6$
$5x^2 - 3x - (7x - 11) = 6$
$5x^2 - 3x - 7x + 11 = 6$
$5x^2 - 10x + 11 - 6 = 0$
$5x^2 - 10x + 5 = 0$ {Decomposition or Quad. Form}
$(5x^2 - 5x - 5x + 5) = 0$ $-5 \times -5 = 25$
$5x(x - 1) - 5(x - 1) = 0$ $-5 + -5 = -10$
$(x - 1)(5x - 5) = 0$
$x - 1 = 0$ or $5x - 5 = 0$
$\boxed{x = 1}$ $\dfrac{5x}{5} = \dfrac{5}{5}$
                      $\boxed{x = 1}$ sub in ①

✱ 1 Solution

① $y = 7x - 11$
$y = 7(1) - 11$
$y = 7 - 11$
$y = -4$

✱ Solution: $(1, -4)$