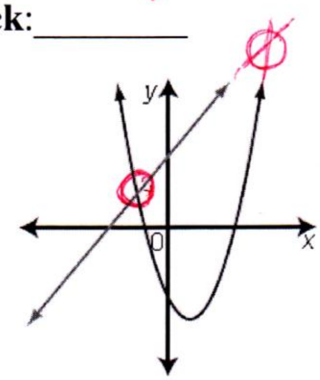
Pre-Calculus 11 Chapter 8 Test Practice. **Name:** KEY

Date:________________ **Block:**________

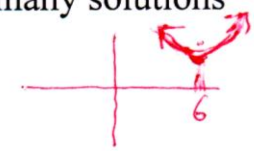
Multiple Choice *For #1 to #5, choose the best answer.*

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



A I only **B** II only
C I and II only **D** II and III only

2. The system $y = \frac{1}{2}(x-6)^2 + 2$ and $y = 2x + k$ has no solution. How many solutions does the system $y = -\frac{1}{2}(x-6)^2 + 2$ and $y = 2x + k$ have?



A none **B** one **C** two **D** infinitely many

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

A It does not have a solution.
B It has at least two real solutions.
C It has an infinite number of solutions.
D It is quadratic-quadratic with a common vertex.

x	y
1	6
2	−3
3	−6
4	−3
5	6

x	y
1	−6
2	−3
3	−2
4	−3
5	−6

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

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

A no solution **B** $x = 2$ **C** $x = -4$ and $x = 2$ **D** $x = -4$ and $x = 0$

5. Connor used the substitution 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: $n = 10 - 3m^2 + m$ line 1

Substitute into the first equation:

$5m - 2(10 - 3m^2 + m) = 25$: line 2 $5m - 20 + 6m^2 - 2m = 25$

$6m^2 + 3m - 45 = 0$: line 3 $2m^2 + m - 15 = 0$

$(2m + 5)(m - 3) = 0$: line 4 $m = 2.5$ or $m = -3$

A line 1 **B** line 2 **C** line 3 **D** line 4

Short Answer

Where necessary, round your answers to the nearest hundredth.

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

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

$4(2)^2 - m = 10$; $6(2)^2 + n = 20$

$16 - m = 10$

$m = 6$

$24 + n = 20$

$n = -24 + 20$

$\boxed{n = -4}$

7. Solve algebraically.

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

$3y = -5x^2 - x - 3 \longrightarrow 6y = -10x^2 - 2x - 6$

$2y = -2x^2 + x - 4 \longrightarrow 6y = -6x^2 + 3x - 12$

$0 = -4x^2 - 5x + 6 = -1(4x^2 + 5x - 6)$

$= -1(4x - 3)(x + 2)$

$x = \frac{3}{4}$ or $x = -2$

$y = \left[-2\left(\frac{3}{4}\right)^2 + \left(\frac{3}{4}\right) - 4\right]\frac{1}{2}$

$= \frac{-35}{16}$

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

$= -7$

$\left(\frac{3}{4}, \frac{-35}{16}\right)$ $(-2, -7)$

b) $\underline{y = 7x - 11}$; $5x^2 - 3x - y = 6$

$5x^2 - 3x - 7x + 11 = 6$

$5x^2 - 10x + 5 = 0$

$5(x^2 - 2x + 1) = 0$

$5(x - 1)(x - 1) = 0$

$x = 1$

$y = 7(1) - 11$

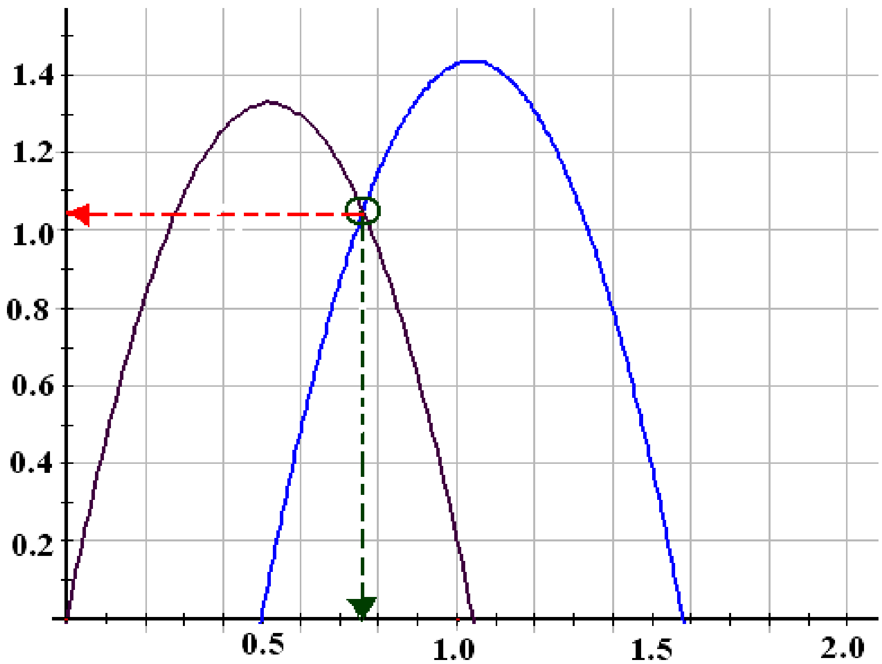
$= -4$

solution: $(1, -4)$

8. For a dance routine, the choreographer has arranged for two dancers to perform jeté jumps in canon. Sophie leaps first, and one count later Noah starts his jump. Sophie's jump can by modeled by the equation $h = -4.9t^2 + 5.1t$ and Noah's by the equation $h = -4.9(t - 0.5)^2 + 5.3(t - 0.5)$. In both equations, t is the time in seconds and h is the height in metres.

a) Solve the system graphically. What are the coordinates of the point(s) of intersection?

b) Interpret the solution in the context of this scenario.



According to the graph, it seems that the point of intersection located at (0.75, 1.04).

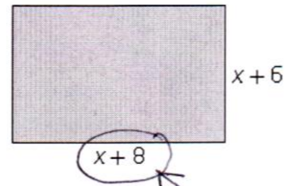
b)

At the time of 0.75 s, both dancers are at the same height above the ground in their performance.

9. The perimeter of the rectangle is represented by $8y$ meters and the area is represented by $(6y + 3)$ square meters.

a) Write two equations in terms of x and y: one for the perimeter and one for the area of the rectangle.

b) Determine the perimeter and the area.



a). $P = 8y = 2(x+8+x+6) = 4x+28$

$A = 6y+3 = (x+8)(x+6) = x^2+14x+48$

$\div 4 \rightarrow \boxed{2y = x+7} \cdot 3 \rightarrow 6y = 3x+21$

b) solve the equations.

$3x+21+3 = x^2+14x+48$

$0 = x^2+11x+24$

$0 = (x+3)(x+8)$

$x=-3$ or $\cancel{x=-8}$ reject

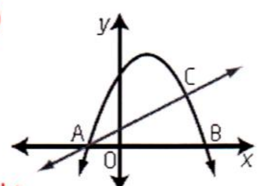
length can not be zero

If $x=-3$, length $=5$, width $=3$

perimeter $= 2(5+3) = \underline{16\ m}$

Area $= 5 \cdot 3 = \underline{15\ m^2}$

10. The parabola $y = -x^2 + 4x + 26.5$ intersects the x-axis at points A and B. The line $y = 1.5x + 5.25$ intersects the parabola at points A and C. Determine the approximate area of ΔABC.



$$x = \frac{-4 \pm \sqrt{16+106}}{-2} \quad \frac{-4+\sqrt{122}}{-2} \approx -3.52\ (A) \quad \frac{-4-\sqrt{122}}{-2} = 7.52\ (B)$$

To find point (C), solve the system of equations.

$$\begin{aligned} y &= -x^2 + 4x + 26.5 \\ (-)\quad y &= 1.5x + 5.25 \\ \hline 0 &= -x^2 + 2.5x + 21.25 \end{aligned}$$

$$x = \frac{-2.5 \pm \sqrt{6.25+85}}{-2}$$

-3.52 (A) $\quad 6.03$ (C)

Area of $\Delta ABC = \frac{1}{2}(\text{base})(\text{height})$

$= \frac{1}{2}(11.04)(14.3)$

$\approx \underline{78.9\ \text{unit}^2}$

point A: $(-3.52, 0)$

B: $(7.52, 0)$

C: $(6.03, 14.3)$

base $= 7.52 - (-3.52)$

$= 11.04$

height $= 14.3 - 0$

$= 14.3$