Name: _____

Date: _____

**Mixed up Quadratic Solving!** Each page will be a mixture of different types of problems. This will help you transition between each type of problem. Complete every problem on the page before getting checked off and moving to a different color.

**GOAL: Can you ACCURATELY complete 2 sheets?**

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1) What are the solutions to the system of equations shown in the graph? (write answers as coordinate points)
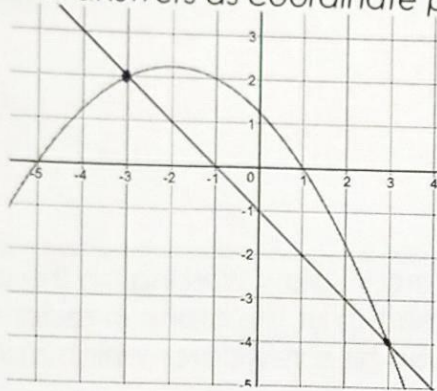


$(-3, 2)$ AND $(3, -4)$

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2) Use the quadratic formula to solve the equation $x^2 + 3x - 1 = 0$

$x = \dfrac{-3 \pm \sqrt{(3)^2 - 4(1)(-1)}}{2}$

$\boxed{x = \dfrac{-3 \pm \sqrt{13}}{2}}$

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3) Solve by factoring:
$$3x^2 + 20x + 12 = 0$$

$\left(x + \dfrac{2}{3}\right)\left(x + \dfrac{18}{3}\right) = 0$

$(3x + 2)(x + 6) = 0$

$\dfrac{36}{1, 36}$
$\boxed{2, 18}$
$3, 12$
$4, 9$

$\boxed{x = -\dfrac{2}{3}}$ $\boxed{x = -6}$

---

4) What are the solutions to the following equation?
$$3(x - 4)^2 + 4 = 25$$
$$\phantom{3(x-4)^2} -4 \quad -4$$

$\dfrac{3(x-4)^2}{3} = \dfrac{21}{3}$

$(x-4)^2 = 7$

$x - 4 = \pm\sqrt{7}$

$\boxed{x = \pm\sqrt{7} + 4}$

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5) A construction worker was standing on top of a new bridge being built over I-75. He accidently dropped his hammer from the top of the bridge. The path that the hammer took to hit the ground can be modeled by the equation $h(t) = -16t^2 + 35$. About how many seconds will it take for his hammer to hit the ground?
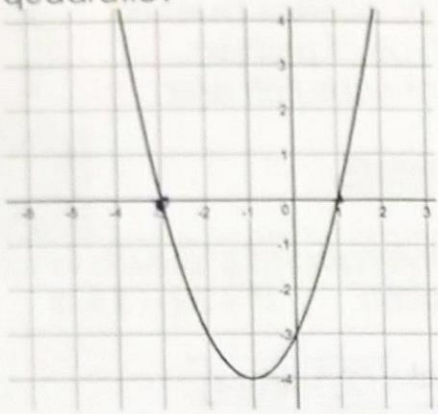
$0 = -16t^2 + 35$
$-35 \qquad\qquad -35$

$-35 = -16t^2$

$2.1875 = t^2$

$\boxed{t \approx 1.5 \text{ SECONDS}}$

**FLIP TO BACK!**

**6)** What are the solutions to the following quadratic?



$x = -3$

$x = 1$

**7)** Given the equation $x^2 - 4x = 5$, what would be needed to add to both sides in order to complete the square?

$$\left(-\frac{4}{2}\right)^2 = \boxed{4}$$

**8)** The same clumsy construction worker from problem 5 is now working on the crane to help move beams into place. He had to go to the top of the crane in order to check the safety locks. While up there he dropped his screwdriver which can be modeled by the equation: $h(t) = -16t^2 + 162$.

a) How high is the crane?

162 feet

b) What is the height of the screwdriver after 2 seconds?

$h = -16(2)^2 + 162$

$\boxed{h = 98 \text{ feet}}$

c) This unlucky clumsy construction worker parked his truck under the crane. The height of the truck is 5 feet. How long will it take to the screwdriver to hit the top of his car?

$5 = -16t^2 + 162$

$-162 \qquad\qquad -162$

$\dfrac{-157}{-16} = \dfrac{-16t^2}{-16}$

$9.8125 = t^2$

$\boxed{t = 3.13 \text{ seconds}}$

WHO IS THAT BLACK WOMAN? **SHIRLEY CHISHOLM**– THE FIRST BLACK WOMAN ELECTED TO THE UNITED STATES CONGRESS. IN 1972 SHE BECAME THE FIRST BLACK WOMAN TO RUN FOR PRESIDENT

**Mixed up Quadratic Solving!** Each page will be a mixture of different types of problems. This will help you transition between each type of problem. Complete every problem on the page before getting checked off and moving to a different color.

### GOAL: Can you complete 3 sheets?

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1) What are the solutions to the system of equations shown in the graph? (write answers as coordinate points)



$(-7, 3)$          $(1, -1)$

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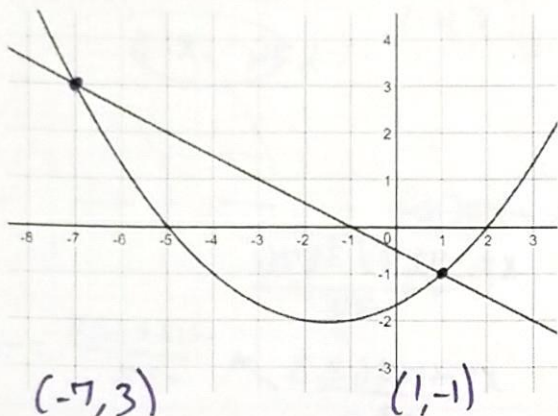
2) Mrs. Oldham is starting up a new company that sells custom Lego mini-figures that match what you look like. Her weekly profit can be measured by the equation $x^2 - 30x - 400$. For what number of items would Mrs. Oldham's profit be equal to zero?

$0 = x^2 - 30x - 400$
$0 = (x - 40)(x + 10)$

$\boxed{x = 40}$   $x = -10$

SHE NEEDS TO SELL 40 MINI-FIGURES

---

3) Use the quadratic formula to solve
$$x^2 + 9x - 1 = 0$$

$$x = \frac{-9 \pm \sqrt{(9)^2 - 4(1)(-1)}}{2}$$

$$x = \frac{-9 \pm \sqrt{85}}{2}$$

---

4) Solve using square roots
$$(x + 2)^2 - 8 = 88$$
$$\phantom{(x+2)^2} +8 \quad +8$$

$$(x + 2)^2 = 96$$

$$x + 2 = \pm 4\sqrt{2}$$

$$\boxed{x = \pm 4\sqrt{2} - 2}$$

---

5) Solve by completing the square
$$x^2 - 8x - 5 = 15$$
$$\phantom{x^2 - 8x} +5 \quad +5$$

$$x^2 - 8x = 20$$

$$x^2 - 8x + 16 = 20 + 16$$

$$(x - 4)^2 = 36$$

$$x - 4 = \pm 6$$

$$x = \pm 6 + 4$$

$$\boxed{x = 10 \text{ AND } x = -2}$$

---

6) Solve by factoring
$$2x^2 + 11x + 5 = 0$$

$$\left(x + \frac{1}{2}\right)\left(x + \frac{10}{2}\right) = 0$$

$$\frac{10}{1, 10}$$
$$2, 5$$

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

$$\boxed{x = -\frac{1}{2} \quad x = -5}$$

**FLIP TO BACK!**

7) Kayla has decided that she wants to start working on her diving in addition to being part of the swim team. She determined that the path of jumping from the high dive can be modeled by the equation
$h(t) = -16t^2 + 48t + 33$

a) How tall is high dive platform?

**33 feet**

b) How many feet above the surface of the pool will Kayla be after 3 seconds?
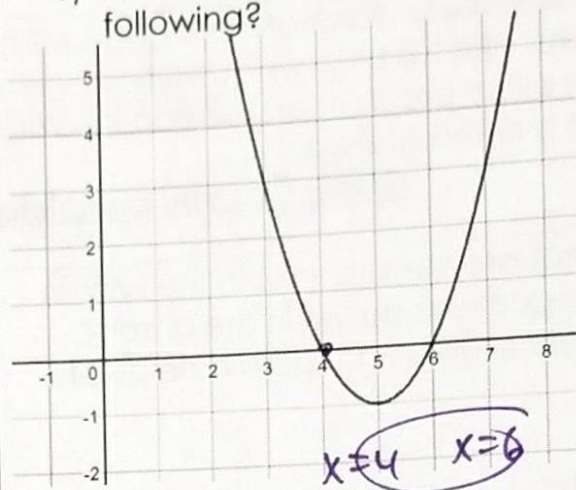
$h = -16(3)^2 + 48(3) + 33$

**15 feet**

c) How long will it take for Kayla to hit the water?

$x = \dfrac{-42 \pm \sqrt{(42)^2 - 4(-16)(33)}}{2(-16)}$

8) What are the solutions to the following?



$x = 4 \qquad \boxed{x = 6}$

$x = \dfrac{-42 \pm \sqrt{3876}}{-32}$

$x = \dfrac{-42 \pm 62.3}{-32}$

$\dfrac{-42 + 62.3}{-32} = -0.6$

$\dfrac{-42 - 62.3}{-32} = 3.3$

$\boxed{\text{ABOUT } 3.3 \text{ SECONDS}}$

WHO IS THAT BLACK WOMAN? **IDA B. WELLS**– SOUTHERN LEADER OF THE WOMAN'S SUFFRAGE MOVEMENT (MEANING GETTING WOMEN THE RIGHT TO VOTE) AS WELL AS ONE OF THE FOUNDERS OF THE NAACP!

Name:_____ Date:_____

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**GOAL: Can you complete 3 sheets?**

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1) What are the solutions to the system of equations shown in the graph? (write answers as coordinate points)

$(-4, 3)$
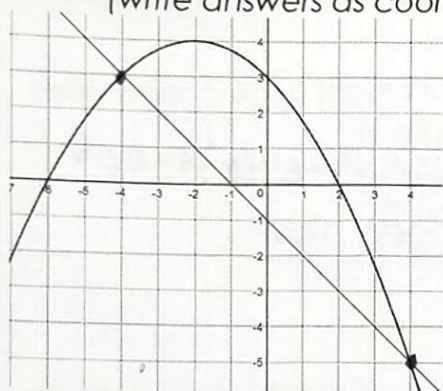


$(0, 8)$
$(4, -5)$

---

2) Use the quadratic formula to solve
$$x^2 + 11x + 2 = 0$$

$$x = \frac{-11 \pm \sqrt{(11)^2 - 4(1)(2)}}{2}$$

$$x = \frac{-11 \pm \sqrt{113}}{2}$$

---

3) Solve by factoring
$$5x^2 + 16x + 3 = 0$$

$$\left(x + \tfrac{1}{5}\right)\left(x + \tfrac{15}{5}\right) = 0$$

$$\frac{15}{1, 15}$$
$$3, 5$$

$$(5x+1)(x+3) = 0$$

$$x = -\tfrac{1}{5} \qquad x = -3$$

---

4) Solve using square roots
$$2(x-5)^2 + 6 = 32$$
$$\qquad\qquad -6 \quad -6$$

$$\frac{2(x-5)^2}{2} = \frac{26}{2}$$

$$\sqrt{(x-5)^2} = \sqrt{13}$$

$$x - 5 = \pm\sqrt{13}$$

$$x = \pm\sqrt{13} + 5$$

---

5) Solve by completing the square
$$x^2 + 18x + 5 = -60$$
$$\qquad\qquad -5 \qquad -5$$

$$x^2 + 18x = -65$$

$$x^2 + 18x + 81 = -65 + 81$$

$$(x+9)^2 = 16$$

$$x + 9 = \pm 4$$
$$-9 \qquad -9$$

$$x = \pm 4 - 9$$

$$x = -5 \qquad x = -13$$

---

6) A basketball has been stuck on the top of the roof of Sprayberry for months. Finally a big gust of wind came and knocked the ball down. It can be modeled by the equation $h(t) = -16t^2 + 26$. How many seconds does it take for the basketball to hit the ground?
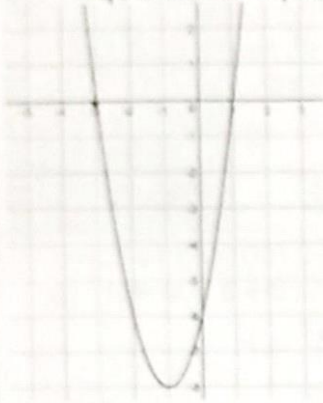
$$0 = -16t^2 + 26$$

$$\frac{-26}{-16} = \frac{-16t^2}{-16}$$

$$1.625 = t^2$$

$$t = 1.3 \text{ seconds}$$

---

**FLIP TO BACK!**

7) What are the solutions to the quadratic equation?

$x = -3$

$x = 1$

8) Robin climbed to the top of Kennesaw Mountain and threw a cookie off the top (why you throwing cookies Robin?!) The path of the cookie can be modeled by the equation $h(t) = -16t^2 + 64t + 1808$

a) How tall is Kennesaw Mountain?

1808 feet

b) At what height is the cookie after 10 seconds?

$h = -16(10)^2 + 64(10) + 1808$

$h = 848$ feet

c) How long will it take the cookie to reach the bottom of the mountain?

$0 = -16t^2 + 64t + 1808$

$x = \dfrac{-64 \pm \sqrt{(64)^2 - 4(-16)(1808)}}{2(-16)}$

$x = \dfrac{-64 \pm \sqrt{119808}}{-32}$

$x = \dfrac{-64 \pm 346.1}{-32}$

$\dfrac{-64 + 346.1}{-32} = -8.8$

$\dfrac{-64 - 346.1}{-32} = 12.8$

12.8 SECONDS

WHO IS THAT BLACK WOMAN? **DR. MAE JEMISON**– THE FIRST BLACK WOMAN TO TRAVEL INTO SPACE. WORKED FOR NASA, IS A DANCER, AN ACTRESS, AND HOLDS NINE DOCTORAL DEGREES!