Quadratics Core Race

**Directions:** Complete each of the following as fast and as accurate as you can. When time is called, please record the number of correct answers on your Core Race record sheet.

1. What is the Quadratic Formula?
2. What is the vertex and axis of symmetry for the following : 
3. State the transformations from the parent function to .
4. Solve by graphing: 
5. Solve by factoring: 
6. Solve using the Quadratic Formula: 
7. Write the equation in vertex form of a quadratic function with a vertex at (2, 3) and a point (-3, -6).
8. Convert  from standard form to vertex form.

**FOOTBALL:** The path of a placekicked football can be modeled by the function $y=-0.026x(x-46) $where x is the horizontal distance (in yards) and y is the corresponding y height (in yards).

1. How far is the football kicked?
2. What is the football’s maximum height?

**Quadratics Core Race Solutions**

Vertex: (1, 6)

Axis of Symmetry: x = 1

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

1.

$$x=-\frac{4}{9} and x=-\frac{4}{5}$$

$$x=-0.444 and x=-0.8$$

Set equal to zero

Y1 = 45x2 + 56x + 16

Y2 = 0

Find intersections

Stretch by a scale factor of 2

Right 4, Up 3

1.
2. $x=\frac{-42\pm \sqrt{(42)^{2}-4\left(8\right)(10)}}{2(8)}$
3. $x=\frac{-42\pm \sqrt{1444}}{16}$
4. $x=\frac{-42\pm 38}{16}$
5. $x=\frac{-42+38}{16} and x=\frac{-42-38}{16}$
6. $x=-\frac{1}{4} and x= -5$

$$\left(x-9\right)\left(x+3\right)=0$$

$$x-9=0 x+3=0$$

$$x= 9 x= -3$$

1.

Step 1. $y-18=x^{2}+ 6x$

Step 2. $y-18+9=x^{2}+ 6x+9$

Step 3. $y-9=\left(x+3\right)^{2}$

Step 4. $y=\left(x+3\right)^{2}+9$

1. $y=a\left(x-2\right)^{2}+ 3$
2. $-6=a(-3-2)^{2}+3$
3. $-6=a(-5)^{2}+3$
4. $-6=25a+3$
5. $-9=25a$
6. $a=-\frac{9}{25}$
7. $y=-\frac{9}{25}\left(x-2\right)^{2}+3$
8.

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* Graph and find the maximum
* 13.754 yards
* Graph and find the x-intercept
* 46 yards
1.
2.