H/W

Quadratic Matching 17/11/20

h) The points (0, 8) and (2, 8) lie on the graph.

This ~~is~~ has to be graph 7. ~~as~~ This is because, we can eliminate all the graphs which don't have a y-intercept ~~sept~~ of 8, as the point (0,8) has to ~~go through th~~ be part of the curve. This would leave only graphs 5) and 7) remaining. As the gradient of ~~graph~~ line 5) is decreasing, it cannot ~~be~~ go through (2,8). Therefore, the graph that matches this statement is graph 7).

- The sum of the roots of this function is 6.

This has to be graph 1. Firstly, we can eliminate all the graphs which do not cross the x-axis, which are graphs 8) and 9). We can also eliminate graph 7) as "each graph is paired with a single statement" and we have paired graph 7) to statement h). For a graph's roots to have a sum of 6, the points of intersection on the x-axis must total 6. As none ~~grap~~ of the roots of any graph are greater than 6, the 2 ~~roo~~ roots must be positive. As a result of this, we can eliminate graphs 2), 3), 4), 5) and 6). Therefore, the remaining graph is graph 1) and so, graph 1 matches this statement. The roots of this graph are 1 and 5, so it does indeed total 6.

- The y-values of this graph ~~a~~ are all greater than 0.

We know that this is graph 8, ~~as~~ Firstly, we can eliminate graphs 1) and 7) as we have used them for previous statements. For all the y-values to be greater than 0, the curve should not intercept the x-axis at any point. The only ~~graphs~~ curves that don't intercept the x-axis at any point are graphs 9) and 8). It cannot be graph 9) as ~~the p~~ all of the y-~~coordinates~~ values are less than 0, as the ~~graph~~ curve is located completely below the x-axis, meaning that y is less than 0. Therefore, it has to be graph 8.

- The line of symmetry of the graph is $x=3$.

We know that this is graph ~~3~~ 9) Firstly, we can eliminate graphs 1), 7) and 8) as they've been used previously. The line of symmetry of a quadratic function is where the curve can be "split" into 2 equal halves with a straight line. The line of symmetry of a quadratic function must have the co-ordinate of its minimum turning point as one of the points of the line of symmetry. This means that the x-value of the ~~?~~ minimum turning point ~~of~~ is equal to 3. Therefore, we can eliminate graph 5) as the x-value of the turning point is less than 0, so cannot equal 3. The x-values of the turning points of graphs 2), 3), 4), 6), 7) and 9) are 1, 1, 0.5, 0.25 and 3 respectively. Therefore, the line of symmetry of graph 4) is $x=3$.

The constant term of this function is -8.

This has to be graph 3). We can eliminate graphs 1), 7), 8) and 9) as they have been used already. The constant term is referring to the y-intercept, so the curve must have a y-intercept of -8. We can eliminate graph 5), as it has a positive y-intercept. Graphs 2), 3), 4) and 6) have y-intercepts of -3, -8, -6 and -1.5 respectively. Therefore, the constant term (y-intercept) of ~~the~~ graph 3) is -8.

The vertex of the graph lies on $x=1$.

This has to be graph 2). We can eliminate graphs 1), 3), 7), 8) and 9), as they have been used previously. In this statement, vertex refers to the minimum turning point. For the line $x=1$ to ~~lie~~ have one of its points as the minimum turning point, the x-value of the minimum turning point must be 1. We can eliminate graph 5), as the minimum turning point is less than 0, so we can visually see that the minimum turning point is less than 1. The x-value of the minimum turning point for graphs 2), 4) and 6) are 1, 0.5 and 0.25 respectively. Therefore, it has to be graph 2).

- The line of symmetry of this graph is $x = k$, where $k < 0$

This has to be graph 5). Firstly, we can eliminate graphs 1), 2), 3), 7), 8) and 9) as they have been used previously. By looking at the graphs, we ~~look~~ can see that the minimum turning point, which the line of symmetry must go through, of graphs 4) and 6) are ~~less~~ greater than $x = 0$, by looking at the axis. Therefore, it has to be graph 5). Indeed, we can see that the line of symmetry for graph 5) is at $x = -1$ and -1 is less than 0.

- This function has a non-integer root.

This has to be graph 6). Firstly, we can eliminate graphs 1), 2), 3), 5), 7), 8) and 4) as they have already been matched. By looking at the graph, we can see that graphs 4) and 6) have roots of ~~-2, 3 and~~ -2 and 3 for graph 4) and -1 and 1.5 for graph 6). As 1.5 is not an integer, it has to be graph 6).

- The sum of the roots of this function is an odd number.

This has to be graph 4). As all of the other graphs have been used previously, it has to be this graph. Indeed, we can add up the x-values of the roots of this graph, which are -2 and 3, and we get 1, which is an odd integer. Therefore, ~~the~~ it has to be graph 4.

All the statements have been paired to a graph. ~~bt~~ I have not gone from a) to ~~h)~~ i) ~~thats~~ alphabetically as some of the statements have more than 1 correct graph that can be paired to it, while others can only be paired to 1 graph.