Quadratics matching:

I decided to start finding graph functions and lines of symetry to then compare

1. roots = 1 and 5
   ∴ equation =
   $y = (x-1)(x-5)$
   you still need to consider if their is a coefficient the whole equation is timed by
   do this by comparing equation to the y-intercept (c)
   $-1 \times -5 = 5$ ← as c is found from timesing numbers in brackets
   y intercept = 5
   ∴ there is no coefficient
   $y = (x-1)(x-5)$
   line of symetry: $x = 3$ as symetry through the vertex
2. roots = -1 and 3
   ∴ equation is
   $y = (x+1)(x-3)$
   coefficient?
   y intercept = -3
   $1 \times -3 = -3$
   ∴ no intercept
   $y = (x+1)(x-3)$
   line of symetry:
   $x = 1$
3. roots = -2 and 4
   equation:
   $y = (x+2)(x-4)$
   check for coefficient:
   y-intercept = -8
   $2 \times -4 = -8$ ∴ no coefficient
   $y = (x+2)(x-4)$
   line of symetry:
   $x = 1$
4. roots = -2 and 3
   equation:
   $y = (x-3)(x+2)$
   check for coefficient:
   y intercept = -6
   $-3 \times 2 = -6$
   ∴ no coefficient
   $y = (x-3)(x+2)$
   line of symetry
   $x = \frac{1}{2}$
5. roots = -4 and 2
   equation:
   $y = -(x+4)(x-2)$ ← timed by -1 as a '∩ shaped' graph
   check for coefficient:
   y intercept = 8
   $-1 \times 4 \times -2 = 8$
   ∴ no coefficient
   $y = -(x+4)(x-2)$
   line of symetry:
   $x = -1$
6. roots = -1 and $\frac{3}{2}$
   equation:
   $y = (x+1)(x-\frac{3}{2})$
   check for coefficient:
   y intersept = $-\frac{3}{2}$
   $1 \times -\frac{3}{2} = -\frac{3}{2}$ ∴ no coefficient
   $y = (x+1)(x-\frac{3}{2})$
   line of symetry:
   $x = \frac{1}{4}$
7. roots = -2 and 4
   equation:
   $y = -(x+2)(x-4)$ ← times by -1 as 'u shaped'
   check for coefficient:
   y intercept = 8
   $-1 \times 2 \times -4 = 8$
   ∴ no coefficient
   $y = -(x+2)(x-4)$
   line of symetry:
   $x = 1$
8. roots = no real roots as doesn't cross the x axis
   this means I couldn't find equation from factorised form. I decided to use the vertex to find the equation in completed square form.
   vertex = (1, 1)
   ∴ vertex found when $(x+a) = 0$ so as $x = 1$
   a must = -1
   y found from +b when $(x+a) = 0$
   ∴ b = 1
   $y = (x-1)^2 + 1$
   still need to check for coefficient:
   y intercept = 2
   y intercept = c in form $y = ax^2 + bx + c$
   so I expanded into that form
   $y = x^2 - x - x + 1 + 1$
   $= x^2 - 2x + 2$
   c = 2 ∴ no coefficient
   line of symetry: $x = 1$
9. roots = no real roots as doesn't cross the x-axis
   had to calculate through computing the square like in 8
   vertex = (3, -1)
   $(x+a) = 0$
   ∴ a = -3
   when $(x+3) = 0$
   y = -1
   ∴ equation: $y = -(x-3)^2 - 1$ ← has a minus coefficient as 'u shaped'
   check for coefficient:
   y intercept = -10
   expand to get in $y = ax^2 + bx + c$ form
   $y = -(x^2 - 3x - 3x + 9) - 1$
   $= -(x^2 - 6x + 9) - 1$
   $= -x^2 + 6x - 9 - 1$
   $= x^2 + 6x - 10$
   ∴ c = -10 = y intercept
   so no coefficient
   line of symetry:
   $x = 3$

I then decided to solve this like a sodoku where I listed all the possibilities ~~and~~

1.	a			g				
2.			~~f~~ e					
3.								
4.					i			
5.			c					
6.		b						
7.				e		n		
8.			d e					
9.	a							

~~after listing~~

sum of roots:

1	1 + 5 = 6
2	-1 + 3 = 2
3	-2 + 4 = 2
4	-2 + 3 = 1
5	-4 + 2 = -2
6	-1 + 3/2 = 1/2
7	-2 + 4 = 2
8	–
9	–

after listing all the possibilities start making deductions

b can only be 6
c can only be 5
d can only be 8
f can only be 3
g can only be 1
h can only be 7
i can only be 4
e can only be 2
as 1 is g 9 has to be a

1	g
2	e
3	f
4	c
5	b
6	n
7	d
8	a
9	a

complete answer