

# ACTION

# RESPONSE

Find approximate or exact solutions to the following pairs. Axes ranges are given.

1.  $y = x^2 + 3x - 2$  and  $y = x$  ( $-5 \leq x \leq 5$ ,  $-5 \leq y \leq 5$ )
2.  $y = x^2 - 3x - 6$  and  $y = 2x$  ( $-4 \leq x \leq 8$ ,  $-10 \leq y \leq 20$ )
3.  $x^2 + y^2 = 25$  and  $x + y = 1$  ( $-6 \leq x \leq 6$ ,  $-6 \leq y \leq 6$ )
4.  $x^2 + y^2 = 4$  and  $y = x + 1$  ( $-5 \leq x \leq 5$ ,  $-5 \leq y \leq 5$ )
5.  $y = x^2 - 3x + 1$  and  $y = 2x - 1$  ( $0 \leq x \leq 6$ ,  $-4 \leq y \leq 12$ )

### Fluency



### Reasoning



Solve the simultaneous equations:  $y = x^2 + 3x - 4$ ;  $y = 5x - 5$  ( $-5 \leq x \leq 5$ ,  $-8 \leq y \leq 8$ ).

- i) What is special about the intersection of these two graphs?
- ii) Show that  $5x - 5 = x^2 + 3x - 4$  can be rearranged to  $x^2 - 2x + 1 = 0$
- iii) Factorise and solve. How does this relate to the intersection of the graphs?

### Problem Solving



Nitesh was given a sketch of the graph  $y = x^2 + 3x + 5$  and asked to draw an appropriate straight line to solve  $x^2 + x - 2 = 0$

This is his working:

Original $y = x^2 + 3x + 5$	$y = x^2 + 3x + 5$ and $y = 2x - 7$
New $0 = x^2 + x - 2$	do not intersect. Therefore there are
$y = 2x - 7$	no solutions.

- i) Show by factorisation that the equation  $x^2 + x - 2 = 0$  has a solution.
- ii) Explain the error that Nitesh made.
- iii) What line should Nitesh have drawn?



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#### Fluency



#### Reasoning



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	$y = 2x - 7$	

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