

Question	Scheme	Marks	AOs
1	$2x(x^2 - 12x + 20)$ or $x(2x^2 - 24x + 40)$	B1	1.1b
	$x^2 - 12x + 20 = (x - 2)(x - 10)$ or e.g. $2x^2 - 24x + 40 = (2x - 4)(x - 10)$	M1	1.1b
	$2x(x - 2)(x - 10)$	A1	1.1b
		(3)	

(3 marks)

Notes

- B1: Takes a factor of $2x$ or x out of the given cubic **correctly**.
Dividing by 2 and then achieving $x(x^2 - 12x + 20)$ does not score this mark unless recovered.
- M1: Attempts to factorise their **quadratic**. Invisible brackets may be implied by later work.
Score for $(x \pm b)(x \pm d)$ where $|bd| = 20$ coming from $x^2 \pm 12x \pm 20$
or for $(ax \pm b)(cx \pm d)$ where $|ac| = 2$ and $|bd| = 40$ coming from $2x^2 \pm 24x \pm 40$
May be scored if they have divided by x but not from e.g. $2x^3 - 24x^2 + 40x \rightarrow (2x - 4)(x - 10)$ without clear indication that they have divided by or taken out a factor of x or $2x$.
There may be incorrect intermediate steps such as $(2x - 20)(2x - 4)$ which do not score the mark on their own but may be ignored if they return to e.g. $(2x - 20)(x - 2)$.
- A1: $2x(x - 2)(x - 10)$ or e.g. $2(x - 10)(x - 2)x$. Do not accept e.g. $x(2x - 4)(x - 10)$. Ignore = 0 ISW after a fully correct factorisation e.g. $2x(x - 2)(x - 10)$ that becomes $x(x - 2)(x - 10)$ and ignore any attempt to find roots (before or after factorisation). Allow $(2x)(x - 2)(x - 10)$

Alternative:

- B1: Takes a factor of $(x - 2)$ or $(x - 10)$ out **correctly** i.e. $(x - 2)(2x^2 - 20x)$ or $(x - 10)(2x^2 - 4x)$. Must be seen as a product of factors and not just in a division attempt but may be implied by later work.
- M1: Attempts to factorise their **quadratic**. Invisible brackets may be implied by later work.
Score for $ax(bx \pm c)$ where $|ab| = "2"$ and $|ac| = \text{their "20" or "4"}$ coming from $Ax^2 + Bx$
- A1: As main scheme.
- Note:** Solutions that solve the cubic = 0 to achieve $x = 0, 2$ and 10 and then arrive at e.g. $x(x - 2)(x - 10)$ score no marks without a prior line of working such as $x(x^2 - 12x + 20)$ (would score M1) or $x(2x^2 - 24x + 40)$ (would score B1).

Some examples:

- $2x^3 - 24x^2 + 40x \rightarrow x(x - 2)(x - 10)$ scores B0M0A0
- $2x^3 - 24x^2 + 40x \rightarrow (2x - 4)(x - 10)$ scores B0M0A0
- $x^2 - 12x + 20 \rightarrow (x + 2)(x - 10)$ scores B0M1A0
- $x^3 - 12x^2 + 20x \rightarrow x(x - 2)(x - 10)$ scores B0M1A0
- $x(2x^2 - 24x + 40) \rightarrow x(x - 2)(x - 10)$ scores B1M0A0
- $x(2x^2 - 24x + 40) \rightarrow \{ x(2x + 2)(2x + 40) \rightarrow \} x(2x + 2)(x + 20)$ scores B1M1A0
- $2x(x^2 - 12x + 20) \rightarrow 2x(x - 1)(x + 20)$ scores B1M1A0
- $2x(x - 2)(x - 10)$ on its own scores B1M1A1