

Topic 15 Quadratics 1 (Post-TT) [30] MARKSCHEME

1.

$(x - 4)(x + 8) = 0$	B1
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2.

$(x - 1)(x + 4)$	M1 $(x \pm 1)(x \pm 4)$ A1 $(x - 1)(x + 4)$ oe
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3.

- (a) $(x + a)(x + b)$ M1
 $ab = \pm 14$
- $(x + 7)(x - 2)$ A1
- (b) $-7, 2$ B1 ft
ft from two linear brackets

[3]

4.

- (a) When $x = 4$, $4^3 - 6 \times 4 - 72 < 0$
 When $x = 5$, $5^3 - 6 \times 5 - 72 > 0$ substitutes both 4 and 5 into equation [M1]
 Since there is a sign change there is a root between 4 and 5 [R1]
- (b) Substitutes a value between 4 and 5 into $x^3 - 6x - 72$ [M1]
 Substitutes 4.6 to get < 0 and 4.7 to get > 0 [M1]
 Substitutes 4.65 to get > 0 [M1]*
 Answer is $x = 4.6$ [A1] dep*

5.

- (a) (i) $(x \pm a)(x \pm b)$ where $ab = 40$ B1
 $(x + 8)(x - 5)$ B1
- (ii) $(x \Rightarrow) - 8$ and $(+) 5$ B1
ft their (i) unless correct answer here

[3]

6.

- (a) When $x = 3$, $2 \times 3^3 - 3 - 80 < 0$
 When $x = 4$, $2 \times 4^3 - 4 - 80 > 0$ substitutes both 3 and 4 into equation [M1]
 Since there is a sign change there is a root between 3 and 4 [R1]
- (b) Substitutes a value between 3 and 4 into $2x^3 - x - 80$ [M1]
 Shows solution is between 3.4 and 3.5 [M1]
 Substitutes 3.46 to get < 0 and 3.47 to get > 0 [M1]
 Substitutes 3.465 to get < 0 [M1]*
 Answer is $x = 3.47$ [A1] dep*

7.

$$(z \pm a)(z \pm b)$$

$$ab = 15$$

M1

$$(z-5)(z-3)$$

A1

5 and 3

A1ft

ft their brackets if M1 awarded

[3]

8.

$5(2x + 1)(2x - 1)$	M1	for $5(4x^2 - 1)$
	A1	

9.

$(3x - 5)(x - 1) [= 0]$	M2	M1 for $(3x + a)(x + b)$ where $3b + a = -8$ or $ab = 5$	Consider other correct methods even though they are specifically asked to factorise (non-calculator)
1 and $\frac{5}{3}$ oe	A1 3 A01.3b	After M0 scored, allow SC1 for both solutions correct	