Mark schemes for Activity 5

A Q22 Jan 19

22	$1-\dfrac{2x+1+\dfrac{1}{3x-2}}{2x+1+\dfrac{1}{x-1}}$ $a+\dfrac{1}{b}=\dfrac{6x^2-x-1}{3x-2}=\dfrac{(3x+1)(2x-1)}{3x-2}$ $a+\dfrac{1}{c}=\dfrac{2x^2-x}{x-1}=\dfrac{x(2x-1)}{x-1}$ $1-\dfrac{(3x+1)(x-1)}{x(3x-2)}$ $\dfrac{(3x^2-2x)-(3x^2-2x-1)}{x(3x-2)}$ Alt: $1-\dfrac{2x+1+\dfrac{1}{3x-2}}{2x+1+\dfrac{1}{x-1}}$ $\dfrac{2x+1+\dfrac{1}{x-1}-\left(2x+1+\dfrac{1}{3x-2}\right)}{2x+1+\dfrac{1}{x-1}}$ $\dfrac{\dfrac{1}{x-1}-\dfrac{1}{3x-2}}{2x+1+\dfrac{1}{x-1}}$	$\dfrac{1}{3x^2-2x}$ $\dfrac{1}{3x^2-2x}$	5	M1 correct substitution M1(ind) expressing $a+\dfrac{1}{b}$ as a single fraction M1 (ind) expressing $a+\dfrac{1}{c}$ as a single fraction M1 expressing unsimplified answer as a single fraction A1 accept $\dfrac{1}{x(3x-2)}$ M1 correct substitution M1 correct expression over a common denominator M1 M1 A1 accept $\dfrac{1}{x(3x-2)}$
	$\dfrac{\dfrac{2x-1}{(x-1)(3x-2)}}{\dfrac{2x^2-x}{(x-1)}}$ or $\dfrac{\dfrac{2x-1}{(x-1)(3x-2)}}{\dfrac{x(2x-1)}{(x-1)}}$			
	Alt: $1-\dfrac{a+\dfrac{1}{b}}{a+\dfrac{1}{c}}=1-\dfrac{\dfrac{ab+1}{b}}{\dfrac{ac+1}{c}}$ $1-\dfrac{c(ab+1)}{b(ac+1)}$ $\dfrac{b-c}{b(ac+1)}$ $\dfrac{(3x-2)-(x-1)}{(3x-2)(2x^2-x)}$ $\dfrac{2x-1}{(3x-2)x(2x-1)}$	$\dfrac{1}{3x^2-2x}$	5	M1 M1 M1 expressing as a single fraction in a,b,c M1 expressing as a single fraction fully factorised A1 accept $\dfrac{1}{x(3x-2)}$

B Q14 Jan 2019

14	**300 × 0.08 oe (=24) or 300 × 9.5 (=2850) or 100(%) – 8(%) (=92(%)) or 1 – 0.08 (=0.92)** **300 – "24" (=276) or for 0.08 × "2850" (=228) or "0.92" × 300 (=276)** **"276" × 9.5 or "2850" – "228" oe**	**2622**	**4**	**M1** **M1** **M1** **A1**	**M2 for 0.92 × "2850"**

C Q17(c) Jan 2019

(c)	$(x+6)(x-3)(=0)$ **or** $x(x+6)-3(x+6)(=0)$ **or** $x(x-3)+6(x-3)(=0)$ $(x+6)(x-3)(=0)$ **or** **for** $x+6=0$ **oe and** $x-3=0$ **oe**	$x=-6, x=3$	3	M1 for $(x\pm6)(x\pm3)(=0)$ **or for** $(x+a)(x+b)$ **with** $ab=-18$ **or** $a+b=3$ A1 for correct factors B1 ft dep on at least M1

D Q17 Jan 2019

Question	Working	Answer	Mark	Notes
17	Either $BAD = 180 - 112$ (=68) or (reflex) $BOD = 2 \times 112$ (=224) Either $ABD = 90$ or (obtuse) $BOD = 136$ or $BOA = 44$ Alt: ACD = 90 (Angles in a semicircle) ACB = 112 – 90 = 22 ADB = 22 (Angles in the same segment / angles from the same chord)	22	5	M1 A1 can be marked on diagram (must be associated with correct angle) A1 2nd angle calculated A1 angle ADB B1 fully correct reasons for their paths NB: This is the most economical method (only requires 2 reasons) A1 M1 A1 A1 + B1 for both reasons Reasons: Opposite angles in a cyclic quadrilateral add up to 180 degrees Angles in a semicircle = 90 degrees / right angle or triangle with a diameter has a right angle / 90 degrees Angles in a triangle add up to 180 degrees Angles at centre = 2 × angles at circumference Base angles in an isosceles triangle are equal Angles on a straight line add up to 180 degrees Angles in the same segment / Angles from the same chord are equal **NB: Be careful here CBD and CDB ≠ 34 but this still gives correct answer**

E Q19 Jan 2019

Question	Working	Answer	Mark	Notes
19	123 – 67 (=56) **or** $2x = 123 - 67$ **or** $2x + y = 67$ **or** $4x + y = 123$ **oe** (x = length of tile, y = width of tile)			M1
	e.g. "56" ÷ 2 (=28)			M1 for method to find length or width
	67 – 56 (=11) **or** 67 – 2×"28" (=11) **or** 123 – 4×"28" (=11)			M1 for method to find other dimension
	(67 – 2×"11") × (123 – 2×"11") (45 × 101) **or** 123 × 67 – 12 × "28" ×" 11" (8241 – 3696)	4545	5	M1 dep on M2 A1