Problem Solving Past Paper Answers GCSE Edexcel – None Calculator

1.

tion	Answer	Mark	Mark scheme
(a)	200	M1	for 120 × 5 ÷ 3 oe
		A1	cao
(b)	statement	C1	Statement that each tap fills at the same rate or that the rate does not change over time Examples **Acceptable responses:** Taps are running at the same speed They (clearly referring to taps) all fill the pool with the same volume of water The amount of water is the same in the same time (again referring to taps) Each tap is doing a fifth of the filling That all taps take equal time to fill the pool All taps produce the same amount of water That the water flow stays at the same rate over the whole time. **Non acceptable responses** It will take more time because there are less taps The less taps used the longer it takes to fill the pool That 1 tap can take up to 24 mins each 3 taps will take longer to fill the pool

2.

	(2, –9)	P1	substitutes $x = 0, y = -5$ into $y = x^2 + ax + b$ $(b = -5)$ **or** substitutes $x = 5, y = 0$ into $y = x^2 + ax + b$ $(0 = 25 + 5a + b)$ **or** starts process to find other intercept, eg writes $y = (x - 5)(x - k)$	
		P1	for complete process to find two intercepts, eg. substitutes the second point into $y = x^2 + ax + b$ and solves to find a $(= -4)$ and b $(= -5)$ **or** substitutes $x = 0, y = -5$ into $y = (x - 5)(x - k)$ and solves to find k $(= -1)$	
		P1	(dep on P2) for factorising or completing the square of $x^2 +$ "–4" $x +$ "–5" and identifying the x-coordinate of the turning point **or** for a complete process to find the x-coordinate of the turning point, eg $(5 +$ "–1"$)/2$	
		A1	cao	x-coordinate of 2 with no or incorrect working gets NO marks

3.

	140	P1	for beginning to solve the problem eg 50 ÷ 5 × 8 (= 80) **or** 14 : 8 : 5 oe **or** 14 : 8 and 8 : 5 oe (linked)	80 may be seen in the ratio 80 : 50
		P1	for a full process to solve the problem eg "80" ÷ 4 × 7 **or** $\frac{50}{5}$ × "14" **or** 140 : 80 : 50	
		A1	cao	If 140 clearly identified as houses in working award full marks

4.

r: 1MA1/1H tion	Answer	Mark	Mark scheme	Additional guidance
(a)	Estimated value	P1	for using a rounded value in a correct process eg 3000 ÷ 15 **or** 15 × 8 **or** 20 × 8	Their rounded value must be used in a calculation Rounding may appear after a correct process eg 15.12 × 8 = 120.96 ≈ 100 followed by eg 3069.25 ÷ 100
		P1	for a full process to find the number of days eg "3000" ÷ "15" ÷ "10" (= 20) **or** "3000" ÷ "15" ÷ 8 (= 25)	Accept 3069.25 ÷ 15.12 ÷ 8 oe
		A1	for a correct answer following through their rounded values	
(b)	Explanation	C1	eg less days required **or** it doesn't affect the answer because I would still round 16.27 down to 15 (or up to 20)	Refers to time taken

5.

	14:21:42	P1	for 2 out of 3 expressions in one letter eg from x, x+7 $2x$+14 **or** see a set of numbers to show interpretation of the relationships, eg 10, 17, 34
		P1	(dep) for sum of their 3 expressions =77 eg $x + x$+7+$2x$+14 =77 oe **or** 2 systematic correct trials including addition
		P1	for a correct process to isolate their term in x **or** x=14
		A1	for ratio 14:21:42 oe

6.

	22.5	P1	for process to find James' speed eg 50÷2.5(=20) **or** 50 ÷ 150 (=$\frac{1}{3}$)
		P1	for process to find James' time for 15 km eg 15 ÷ "20" (=0.75) **or** 15 ÷ $\frac{1}{3}$ (=45)
		P1	for process to find Peter's time for 15 km eg "45" − 5 (=40)
		P1	for process to find Peter's speed eg 15 ÷ "40" **or** 15 ÷ $\frac{"40"}{60}$
		A1	oe

7.

Question	Working	Answer	Mark	Notes
		Tea £1.40	P1	for setting up two appropriate equations eg $3t + 2c = 7.80$, $5t + 4c = 14.20$
		Coffee £1.80	M1	for method to eliminate one variable, condone one arithmetic error
			M1	for method to substitute found variable or start again
			A1	Tea £1.4(0) and Coffee £1.8(0) with amounts linked to correct drinks

8.

(a)		120	P1	for $\frac{4\times450}{15}$ **or** $\frac{4}{15}=\frac{x}{450}$ oe
			A1	cao
(b)		$\frac{165}{450}$	P1	5.5 **or** 6.5 **or** 165 **or** $\frac{5\times450}{15}$ (=150) and $\frac{6\times450}{15}$ (=180)
			A1	for $\frac{165}{450}$ oe

9.

	72	P1	for showing the process of 30 × 60 (=1800) or 20 × 54 (=1080)
		P1	(dep P1) for showing the complete process e.g. (“1800” – “1080”) ÷ 10
		A1	concluding the answer is 72 (and not 66)

10.

stion	Working	Answer	Mark	Notes
		$\frac{1}{3}$	P1	process to solve the problem e.g. $\frac{3}{10}\times\frac{4}{9}(=\frac{12}{90}=\frac{2}{15})$ OR finds the number of white circles for their chosen number OR for 9 : 21 (or a multiple of 9 : 21)
			P1	second step of the process e.g. $\frac{7}{10}\times\frac{2}{7}(=\frac{14}{70}=\frac{2}{10}=\frac{1}{5})$ OR finds the number of black circles for their chosen number OR for a multiple of 2 : 5 where the ratio parts sum to “21”
			P1	for complete process e.g. $"\frac{2}{15}"+"\frac{1}{5}"\left(=\frac{4}{30}+\frac{6}{30}\right)$ OR finds the total number of circles for their chosen number OR for 3 ratios that could be used to solve the problem eg 9 : 21 with 4 : 5 with 6 : 15
			A1	for $\frac{1}{3}$ oe