Teacher Intervention Report

TEST-AQA-8300P3H-NOV25 | AQA | 1 batch | 4 Sept 2026

EXCELAS.ai

10	62/80	10	0
STUDENTS	MEAN AVERAGE	PASSING	BELOW PASS

1. Question Performance (Worst to Best)

All questions sorted by average score - focus reteaching on top rows

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
Q11(b)	Amin throws a ball into a cup 50 times, with cumulative relative frequency of successes reaching 0.32 after 50 throws (16 successes out of 50). Write down the best estimate of the probability of a successful throw.	Probability	-	U510	0.4/1		0%	[1 mark] **B1ft:** 0.32
Q17(b)	100 ice creams were sold. 36 were vanilla; 12 of the vanilla had syrup on (so 24 vanilla without syrup). Two of the vanilla ice creams are chosen at random. Work out the probability that exactly one of them has syrup on.	Probability	-	U104, U714	1.3/3		0%	[3 marks] **M1:** 12/36 × 24/35 or 288/1260 or 8/35 **M1dep:** 2 × their 8/35 **A1:** 16/35 or 0.457(1...)
Q23	P is the point (3, 6) on a circle, centre O (the origin). Work out the equation of this circle.	Algebra	Graphs	U889	0.9/2		0%	[2 marks] **M1:** $3^2 + 6^2$ or 45 or $\sqrt{45}$ **A1:** $x^2 + y^2 = 45$
Q9	In a game, each player rolls an ordinary dice. If they roll a 6 they roll the dice again. If they then roll another 6 they do not roll again. 1038 people each play the game once. Altogether, the dice is rolled 1092 times. Do you think the dice is biased? Tick a box (Yes/No). Show working to support your answer.	Probability	-	U166	1.5/3		0%	[3 marks] **M1:** Method A - Alternative method 1: comparing actual number of 6s to expected number 1038 ÷ 6 or 173 **M1dep:** Method A - 1038 + their 173 or 1211 **A1:** Method A - Yes **and** 1211 **M1:** Method B - Alternative method 2: comparing actual extra number of 6s to expected number 1038 ÷ 6 or 173 **M1:** Method B - 1092 – 1038 or 54 **A1:** Method B - Yes **and** 173 and 54 **M1:** Method C - Alternative method 3: comparing relative frequency to theoretical probability 1092 – 1038 or 54 or 1092 ÷ 1038 or

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
								1.05(2...) or 1/6 **M1dep:** Method C - their 54 ÷ 1038 or their 1.05(2...) – 1 or 0.05(2...) **A1:** Method C - Yes **and** 0.05(2...) **and** 0.16(6...) or 0.167 or 0.17
Q12(b)	Four people A, B, C and D take part in a game where only A or B can finish 1st and A cannot finish 4th, giving 10 equally likely finishing orders. Assume that all the finishing positions are equally likely. Work out the probability that the first two positions are filled by A and B in either order.	Probability	-	U104, U714	0.5/1		0%	[1 mark] **B1ft:** 4/10
Q11(a)	Amin is trying to throw a ball into a cup. He throws the ball 50 times. He records the number of times the ball lands in the cup for every 10 throws. Throws 1–10: 2 successes; 11–20: 4; 21–30: 6; 31–40: 2; 41–50: 2. Complete the relative frequency graph for the data. (Existing plotted points: (10, 0.2) and (20, 0.3); relative frequencies are cumulative: 0.2, 0.3, 0.4 for first three groups.)	Probability	Statistics	U280, U580	1.7/3		0%	[3 marks] **B3:** (30, 0.4) and (40, 0.35) and (50, 0.32) plotted **and** graph completed with straight lines
Q12(c)	Four people A, B, C and D take part in a game. In fact, the finishing positions are not equally likely. What does this mean about the probability that the first two positions are filled by A and B in either order? Tick one box.	Probability	-	U166	0.6/1		0%	[1 mark] **B1:** It is not possible to tell
Q16(b)	AC and BD are the diagonals of rhombus ABCD. A is (–1, 3) and C is (7, –2). Work out the coordinates of the point where AC and BD intersect.	Algebra	Graphs	U933	1.2/2		0%	[2 marks] **M1:** (–1 + 7)/2 or 3 or (3 – 2)/2 or 0.5 **A1:** (3, 0.5)
Q21(a)	y is inversely proportional to x^2. y = 32 when x = 0.5. Work out an equation connecting y and x.	Ratio, proportion and rates of change	-	U357	1.8/3		0%	[3 marks] **M1:** Method A - Alternative method 1: sets up $y = k \times 1/x^2$ $y = k \times 1/x^2$ **M1dep:** Method A - (k =) 32×0.5^2 or (k =) 8 **A1:** Method A - $y = 8/x^2$ **M1:** Method B - Alternative method 2:

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
								sets up c × y = 1/x² c × y = 1/x² **M1dep:** Method B – (c =) 1/(32×0.5²) or (c =) 0.125 **A1:** Method B – 0.125 × y = 1/x²
Q22(b)	Referring to your estimate of the average speed of the train from the speed-time graph (curve decreasing from 50 to 0 between 4.5 and 6 hours). Is your answer to part (a) likely to be an underestimate or an overestimate? Tick a box. Give a reason for your answer.	Number	Measures and accuracy	U225	0.6/1		0%	[1 mark] **B1ft:** Correct box ticked with suitable comment
Q14	ABCDE is a pentagon with x : y = 1 : 3. Angle at D = 144°, angle at A = 90°, angle EAB region and other marked angles; angle marked x is at C and angle marked y is at E, with a 138° angle at B. Prove that AB and DC are parallel.	Geometry and measures	Properties and constructions	U427, U826	2.5/4		0%	[4 marks] **M1:** Method A – Alternative method 1: shows that x and 138° are co-interior (5 – 2) × 180 or 540 **M1dep:** Method A – (their 540 – 144 – 138 – 90) ÷ (3 + 1) or 168 ÷ 4 or 42 **A1:** Method A – 42 + 138 = 180 **B1:** Method A – Correct reasons for their proof with M2A1 awarded **M1:** Method B – Alternative method 2: assumes that they are parallel and uses sum of angles (5 – 2) × 180 or 540 **M1:** Method B – 180 – 138 = 42 **A1:** Method B – 3 × 42 + 42 + 144 + 138 + 90 = 540 **B1:** Method B – Correct reasons for their proof with M2A1 awarded
Q8(b)	An ice hockey puck is a cylinder with mass 170 g. In part (a) density was found for d = 7.6 cm and h = 2.5 cm. In fact, d = 7.62 cm and h = 2.54 cm. Without further calculation, how does this affect the density? Tick one box.	Number	Measures and accuracy	U225	0.7/1		0%	[1 mark] **B1:** The density is less than the answer to part (a)
Q21(b)	y is inversely proportional to x², with y = 32 when x = 0.5 (so y = 8/x²). Work out the value of y when x = 5.	Ratio, proportion and rates of change	-	U357	1.4/2		0%	[2 marks] **M1:** Method A – Alternative method 1: if using alt 1 in (a) their k ÷ 5² **A1ft:** Method A – 0.32 or 8/25 **M1:** Method B – Alternative method 2: if using alt 2 in (a) 1 / (their c × 5²)

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
								A1ft: Method B - 0.32 or 8/25
Q22(a)	The speed-time graph for a train journey is shown. Speed rises from 0 at time 0 to 50 km/h at 2.5 hours (straight line), stays at 50 km/h until 4.5 hours, then curves down to 0 at 6 hours. Estimate the average speed of the train for this journey. You must show your working.	Algebra	Graphs	U151	2.9/4		0%	[4 marks] **M1:** Method A - Alternative method 1: splits into triangle, rectangle and triangle 1/2 × 2.5 × 50 or 62.5 or 2 × 50 or 100 **M1:** Method A - 1/2 × 1.5 × 50 or 37.5 **M1dep:** Method A - (their 62.5 + their 100 + their 37.5) ÷ 6 **A1:** Method A - [31, 35] **M1:** Method B - Alternative method 2: splits into a trapezium and a triangle 1/2 × (2 + 4.5) × 50 or 162.5 or 1/2 × (2 + 3.5) × 50 or 137.5 **M1:** Method B - 1/2 × 1.5 × 50 or 37.5 or 1/2 × 2.5 × 50 or 62.5 **M1dep:** Method B - (their 162.5 + their 37.5) ÷ 6 or (their 137.5 + their 62.5) ÷ 6 **A1:** Method B - [31, 35] **M2:** Method C - Alternative method 3: whole thing is a trapezium 1/2 × (2 + 6) × 50 or 200 **M1dep:** Method C - their 200 ÷ 6 **A1:** Method C - [31, 35]
Q19	Marnie wants to sketch the graph of y = 0.5^x for x ⩾ 0. Her attempt shows a decreasing curve starting at 0.5 on the y-axis and touching the x-axis. Make two criticisms of her graph.	Algebra	Graphs	U652, U862, U896, U681 +5	1.5/2		0%	[2 marks] **B1:** Valid criticism referring to the y-intercept **B1:** Valid criticism referring to the x-intercept
Q16(a)	AC and BD are the diagonals of rhombus ABCD. A is (−1, 3) and C is (7, −2). Work out the gradient of BD.	Algebra	Graphs	U898, U889	2.3/3		0%	[3 marks] **M1:** (Gradient of AC =) (−2 − 3)/(7 − (−1)) **A1:** −5/8 or −0.625 **A1ft:** 8/5 or 1.6
Q10	Write down the only regular polygon where size of interior angle < size of exterior angle	Geometry and measures	Properties and constructions	U427	0.8/1		0%	[1 mark] **B1:** (Equilateral) triangle
Q15	100 g of a cake contains 30 g of flour. 1/6 of the same cake contains 27.5 g of flour. Work out the	Number	Fractions, decimals and percentages	U176, U753	2.4/3		0%	[3 marks] **M1:** Method A - Alternative method 1: scales up using flour

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
	mass of the whole cake.							in portion and whole cake 27.5 × 6 or 165 **M1dep:** Method A – their 165 ÷ 30 or 5.5 or 11/2 **A1:** Method A – 550 **M1:** Method B – Alternative method 2: scales up using fraction of cake that is flour 27.5 × 6 or 165 **M1:** Method B – 100 ÷ 30 or 10/3 or 3.3(3...) **A1:** Method B – 550 **M1:** Method C – Alternative method 3: scales up using proportion of 100 g to one sixth 27.5/30 or 11/12 or 0.916(6...) or 30/27.5 or 12/11 or 1.09(...) **M1dep:** Method C – their 11/12 × 100 or 1100/12 or their 12/11 × 100 or 1200/11 **A1:** Method C – 550 **M1:** Method D – Alternative method 4: sets up and solves an equation 100/x = 30/(6×27.5) **M1dep:** Method D – (x =) 100 ÷ 30/(6×27.5) **A1:** Method D – 550
Q20	C, D, E and F are points on a circle. ACF, BCD and DEG are straight lines. Angle ACB (at C, between A and B) = y. Angle at E (angle DEF) region marked x. Prove that y = x. Give a reason for each stage of your working.	Geometry and measures	Properties and constructions	U767	2.5/3		0%	[3 marks] **M1:** Method A – Alternative method 1: uses DEF, then DCF DEF = 180 – x **M1dep:** Method A – DCF = 180 – (180 – x) or DCF = x **A1:** Method A – y = x and M2 scored **and** all correct statements • angles on a __straight__ line add to __180__° • opposite angles in a __cyclic quadrilateral__ add to __180__° • vertically __opposite angles__ are __equal__ **M1:** Method B – Alternative method 2: uses DCF, then DEF DCF = y **M1dep:** Method B – DEF = 180 – y **A1:** Method B – y = x and M2 scored **and** all correct statements • vertically __opposite angles__

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
								are __equal__ • opposite angles in a __cyclic quadrilateral__ add to __180__° • angles on a __straight__ line add to __180__° **M1:** Method C – Alternative method 3: exterior angle of a cyclic quadrilateral DCF = y **M1dep:** Method C – FEG = y **A1:** Method C – y = x and M2 scored **and** all correct statements • vertically __opposite angles__ are __equal__ • an exterior angle in a __cyclic quadrilateral__ is equal to the opposite interior angle
Q8(a)	An ice hockey puck is a cylinder with diameter d and height h. The mass of the puck is 170 g. Work out the density of the puck when d = 7.6 cm and h = 2.5 cm. State the units of your answer.	Number	Measures and accuracy	U915	3.5/4		0%	[4 marks] **M1:** π × (7.6 ÷ 2)² × 2.5 or 36.1π or [113.3, 113.43] **M1:** 170 ÷ their [113.3, 113.43] **A1:** [1.49, 1.5] **B1ft:** g/cm³
Q18	The table and histogram show information about the value of 90 houses. Table: 150 ⩽ v < 190 frequency 6; 190 ⩽ v < 220 frequency 12; 220 ⩽ v < 250 frequency (missing); 250 ⩽ v < 300 frequency 45; 300 ⩽ v < 350 frequency 4. Histogram bars given: 150–190 height 0.2, 250–300 height 0.9. Complete the table and the histogram.	Statistics	-	U981, U312, U653, U506 +11	3.5/4		0%	[4 marks] **M1:** 12 ÷ 30 or 0.4 or 4 ÷ 50 or 0.08 **A1:** Bar from 190 to 220, height 0.4 **and** bar from 300 to 350, height 0.08 **M1:** 0.2 × 40 or 8 or 0.7 × 30 or 21 **A1:** 8 in 150 ⩽ v < 190 row **and** 21 in 220 ⩽ v < 250 row
Q1	Solve 2/5 x = 7	Algebra	Solving equations and inequalities	U755	1.8/2		0%	[2 marks] **M1:** 2x = 7 × 5 or 2x = 35 or x/5 = 7 ÷ 2 or x/5 = 7/2 or 7 ÷ 2/5 or (7×5)/2 **A1:** 35/2 or 17 1/2 or 17.5
Q2	Factorise fully x² – 16	Algebra	Notation, vocabulary and manipulation	U963	0.9/1		0%	[1 mark] **B1:** (x + 4)(x – 4)
Q4	Mo and Nik share some money. Mo gets 3/5 of the money and £810. Mo gives £380 to charity. Nik gives 45% of his money to charity. In total, how	Number	Fractions, decimals and percentages	U554	3.6/4		0%	[4 marks] **M1:** 810 ÷ 3 or 270 **M1dep:** 810 ÷ 3 × (5 – 3) or 810 ÷ 3 × 5 × (1 – 3/5)

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
	much money do they give to charity?							or 810 ÷ 3 × 5 – 810 or 540 **M1dep:** 0.45 × their 540 or 243 **A1:** 623(.00)
Q12(a)	Four people, A, B, C and D take part in a game. Only A or B can finish in 1st position. A cannot finish in 4th position. The first row of the table is A B C D. Complete the table to show the other nine possible finishing positions.	Number	Structure and calculation	U714, U369	2.7/3		0%	[3 marks] **B3:** A B D C A C B D A C D B A D B C A D C B B A C D B A D C B C A D B D A C with no incorrect combinations
Q24(b)	A solution to an equation is found using the iterative formula x_(n+1) = cube root of (2x_n + 6) with x_1 = 3. Work out the solution to 5 decimal places.	Number	Measures and accuracy	U480, U298, U731, U965 +1	0.9/1		0%	[1 mark] **B1:** 2.17998
Q6	The angles of a quadrilateral are in the ratio 2 : 3 : 3 : 4. Work out the largest angle.	Geometry and measures	Properties and constructions	U732, U577	2.8/3		0%	[3 marks] **M1:** 2 + 3 + 3 + 4 or 12 **M1dep:** 360 ÷ their 12 or 30 **A1:** 120
Q24(a)	A solution to an equation is found using the iterative formula x_(n+1) = cube root of (2x_n + 6) with x_1 = 3. Work out the values of x_2 and x_3. Give your answers to 5 decimal places.	Number	Measures and accuracy	U480, U298, U731, U965 +1	1.9/2		0%	[2 marks] **B1:** 2.28943 **B1ft:** 2.19523
Q17(a)	100 ice creams were sold. 36 were vanilla ice creams. 12 of the vanilla ice creams had syrup on. 59 of the ice creams had syrup on. Complete the Venn diagram (two sets: Vanilla and Syrup, within a universal set of 100).	Probability	-	U476	2.9/3		0%	[3 marks] **B3:** Fully correct diagram
Q3	Here is some information about the number of people at a musical on three days. Thursday: 160 people; Friday: 25% more than Thursday; Saturday: 10% more than Friday. How many people were at the musical on Saturday?	Ratio, proportion and rates of change	Fractions, decimals and percentages	U773	3/3		0%	[3 marks] **M1:** Method A – Alternative method 1: works out each day's number of people 160 × 1.25 or 200 **M1dep:** Method A – their 200 × 1.1(0) **A1:** Method A – 220 **M1:** Method B – Alternative method 2: uses a compound increase 1.25 × 1.1(0) or 1.375 **M1dep:** Method B – 160 × 1.375 **A1:** Method B – 220
Q5	The term-to-term rule of a sequence is 'double the previous term and add 7'. The	Algebra	Sequences	U213	3/3		0%	[3 marks] **M1:** 2(3b – 5) + 7 **A1:** 6b – 3 or – 3 + 6b

Q	Question	Topic	Subtopic path	SPARX	Avg Marks	Distribution	Blank	Mark Scheme
	first term is 3b − 5. Work out the third term.							**B1ft:** 12b + 1 or 1 + 12b
Q7	A right-angled triangle has hypotenuse 5 cm (the sloping side from top-left to bottom-right), the horizontal top side is x cm, the right angle is at the top-right, and the angle at the bottom-right is 25°. Use trigonometry to work out the value of x. You must show your working.	Geometry and measures	Mensuration and calculation	U164	3/3		0%	[3 marks] **M1:** Method A – Alternative method 1: uses or states sin or cos 65 sin or cos 65 stated or used **M1dep:** Method A – sin 25 = x/5 or 5 × sin 25 or cos 65 = x/5 or 5 × cos 65 **A1:** Method A – [2.1, 2.12] with M2 awarded **M1:** Method B – Alternative method 2: works out vertical side first 5 × cos 25 or 5 × sin 65 or [4.5, 4.55] **M1dep:** Method B – √(5² – (their [4.5, 4.55])²) or √[4.29, 4.75] or their [4.5, 4.55] × tan 25 or their [4.5, 4.55] ÷ tan 65 **A1:** Method B – [2.1, 2.12] with M2 awarded
Q13	y is inversely proportional to x. Four graphs are shown: A is a straight line through origin with positive gradient; B is a reciprocal curve (y = 1/x shape) decreasing steeply then levelling off; C is a straight line with negative gradient; D is an increasing curve (quadratic shape). Circle the letter above the graph that shows this.	Ratio, proportion and rates of change	-	U238	1/1		0%	[1 mark] **B1:** B

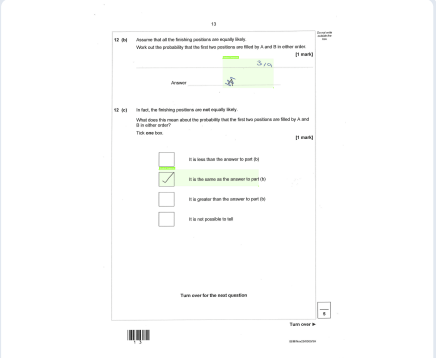
2. Students Below Pass (0 students)

All students below Grade 4 (26%) sorted worst to best - Gap = marks needed (Grade boundaries 2024-26 · AQA · Higher)

Student	Score	%	Gap
All students at or above pass!			

3. Key Misconceptions (with Student Examples)

1 Ignoring permutations of unmentioned items in combinations (Q12(b))



Example: Test Student 2

5 marks lost here by 5 students:

Students mistakenly believe there are only two favourable outcomes because they solely consider the arrangement of the explicitly mentioned items (A and B can be ordered as AB or BA). They fail to realise that the remaining unmentioned items (C and D) can also be arranged in multiple ways for each scenario, creating additional valid finishing combinations.

What students wrote:

Test Student 2: "$3/9$ Answer [scribbled out (illegible)]"

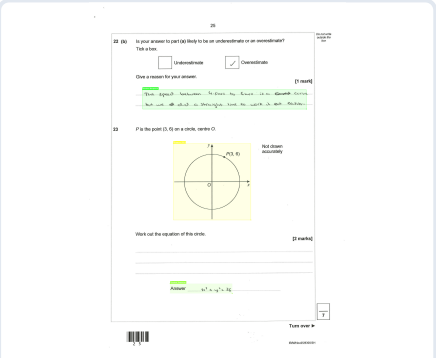
Test Student 3: "Answer line ____ [scribbled out (20%)] $\frac{1}{2}$"

Test Student 4: "$\frac{2}{10}$ Answer $\frac{1}{5}$"

Test Student 9: "Answer line: $\frac{\text{[scribbled out 4]2}}{10}$"

Test Student 11: "$\frac{1}{4}$ [scribbled out illegible text] Answer $\frac{1}{2}$"

2 Using a point's y-coordinate as the circle's radius (Q23)



Example: Test Student 1

11 marks lost here by 7 students:

Students commonly believe that the radius of a circle centered at the origin is equal to the y-coordinate of a given point on its circumference. Consequently, they substitute the square of the y-coordinate (e.g., $6^2 = 36$) as r^2 in the standard circle equation, rather than correctly applying Pythagoras' theorem to both the x and y coordinates.

What students wrote:

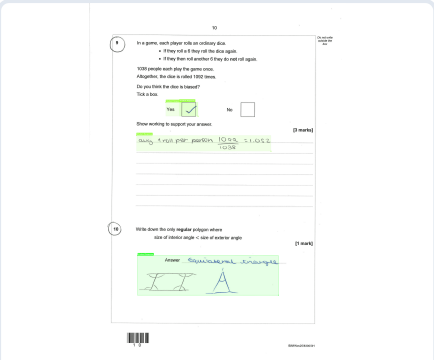
Test Student 1: "Answer $x^2 + y^2 = 36$"

Test Student 2: "Answer `$x^2 + y^2 = 36$`"

Test Student 3: "Answer `$x^2 + y^2 = 6$`"

Test Student 5: "$\frac{6}{3} = 2\ 6 = 3(2) + 0$ Answer $x^2 + y^2 = 36$"

3 Failing to compare expected frequencies against actual experimental (Q9)



Example: Test Student 2

15 marks lost here by 8 students:

Students think that successfully calculating a theoretical expectation (such as the expected number of extra dice rolls) is the final step to proving a game is fair. They do not realise that they must logically compare this mathematically expected frequency against the actual experimental data to determine if a discrepancy exists that proves bias.

What students wrote:

Test Student 2: "Based on the image provided, here is the student's handwritten response for Question 9: **Selected ..."

Test Student 3: "The student has ticked the "Yes" box. **Working:** [scribbled out ($\frac{1}{6} \times \frac{1}{6} ..."

Test Student 4: "Based on the student's handwritten response for Question 9: **Box Selection:** * **Yes:** [scribb..."

Test Student 11: "Based on the image provided, here is the OCR of the student's handwritten response for Question 9: ..."

Quick Actions

This Week

- Address Section 1 topics in starter activities
- Pull Section 2 students for 1:1 check-ins

Next Assessment

- Use Section 3 diagnostic Qs as warm-up
- Pre-teach identified misconceptions