PRACTICE EXAM 13:NY REGENTS ALGEBRA I SIMULATION — 35 QUESTIONS

Recommended Time: 3 Hours

Required Tools: Graphing Calculator, Straightedge

Directions: Answer all 35 questions. For Part I, select the best answer. For Parts II, III, and IV, show all work. Partial credit is available on Parts II–IV.

PART I — Multiple Choice (Questions 1–24)

Each correct answer is worth 2 credits. No partial credit. No penalty for guessing.

1. Which of the following best explains why the number 0.121221222122221… is irrational?

A. It is irrational because it contains only the digits 1 and 2

B. It is irrational because it is less than 1

C. It is irrational because it has more than 10 decimal places

D. It is irrational because it is non-terminating and non-repeating

2. A function f(x) is linear and satisfies $f(0) = 7$ and $f(4) = -1$. Which equation represents f(x)?

A. $f(x) = -2x + 7$

B. $f(x) = 2x + 7$

C. $f(x) = -2x - 7$

D. $f(x) = 2x - 7$

3. Which expression is equivalent to $4x(x - 3) - (2x - 1)^2$?

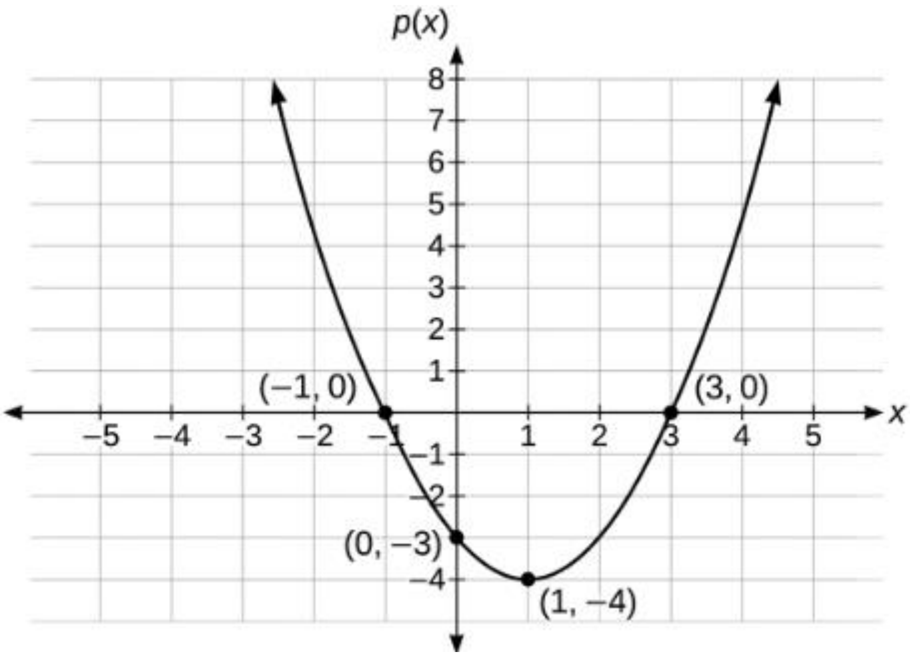
A. $2x^2 - 4x + 1$

B. $-4x - 1$

C. -1

D. $2x^2 - 16x + 1$

4. The graph below shows the function p(x).



Which statement about p(x) is FALSE?

A. The axis of symmetry is x = 1

B. The zeros are x = −1 and x = 3

C. The vertex is a minimum at (1, −4)

D. The y-intercept is (0, 3)

5. A student earns $14.50 per hour and pays a flat weekly transportation cost of $22. She wants her weekly take-home pay (after transportation) to be at least $275. Which inequality models this situation, and what is the minimum number of whole hours she must work?

A. 14.50h − 22 > 275; at least 21 hours

B. $14.50h + 22 \geq 275$; at least 18 hours

C. $14.50h \leq 275 - 22$; at most 21 hours

D. $14.50h - 22 \geq 275$; at least 21 hours

6. What is the solution to the system of equations?

$3x - y = 11$

$x + 2y = 2$

A. (4, 1)

B. (3, −2)

C. (2, −5)

D. (5, 4)

7. The table below shows selected values of two functions.

x	f(x)
0	1
1	2
2	4
3	8
4	16

x	g(x)
0	3
1	6
2	9
3	12
4	15

Which statement correctly compares f(x) and g(x) over the interval from x = 0 to x = 4?

A. g(x) is always greater than f(x) on this interval

B. f(x) is always greater than g(x) on this interval

C. f(x) and g(x) intersect exactly once, and f(x) exceeds g(x) for x > 3

D. g(x) exceeds f(x) for all x in the interval since it starts higher at x = 0

8. Which of the following correctly identifies the range of $f(x) = -(x - 2)^2 + 9$?

A. All real numbers greater than or equal to 9

B. All real numbers less than or equal to 9

C. All real numbers greater than 9

D. $f(x) = 9$ only

9. A store's weekly profit P (in dollars) from selling x items is modeled by $P(x) = -5x^2 + 200x - 500$. How many items should be sold to maximize profit, and what is that maximum profit?

A. 20 items; $1,000 profit

B. 40 items; $2,500 profit

C. 20 items; $1,500 profit

D. 10 items; $500 profit

10. Which of the following correctly factors $8x^3 - 50x$?

A. $2x(4x - 25)$

B. $2(4x^3 - 25x)$

C. $2x(2x + 5)(2x + 5)$

D. $2x(2x - 5)(2x + 5)$

11. The two-way table below shows results from a survey of 240 gym members about their workout type and membership tier.

	Basic Tier	Premium Tier	Total
Cardio	72	48	120
Strength	48	72	120
Total	120	120	240

Of Premium tier members, what percentage prefer strength training?

A. 60%

B. 40%

C. 50%

D. 30%

12. A line is defined by the equation $6x - 3y = 15$. Which of the following is parallel to this line?

A. $y = -2x + 5$

B. $y = 3x - 1$

C. $y = 2x + 7$

D. $y = (1/2)x - 3$

13. The explicit formula for a sequence is $a_n = 4(-3)^\wedge(n-1)$. What is the 4th term and what type of sequence is this?

A. 4th term = 108; arithmetic with common difference −3

B. 4th term = −108; geometric with common ratio −3

C. 4th term = −108; arithmetic with common difference 4

D. 4th term = 108; geometric with common ratio 3

14. A school orders notebooks and pens. Notebooks cost $3 each and pens cost $1.50 each. The school spends exactly $90 and buys a total of 40 items. How many notebooks were ordered?

A. 20 notebooks

B. 25 notebooks

C. 15 notebooks

D. 30 notebooks

15. The graph below shows the system of equations $y = x^2 - 4$ and $y = 2x - 1$.

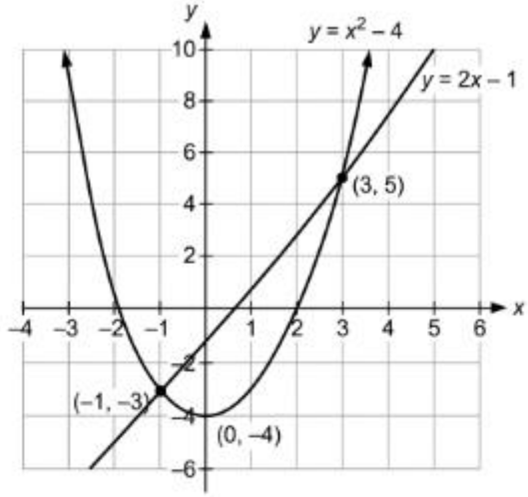


Figure PQ-4

What are the solutions to the system?

A. x = 3 only

B. x = −1 only

C. x = 3 and x = −1

D. x = 0 and x = 2

16. Which of the following correctly solves $2x^2 + 7x - 15 = 0$ using the quadratic formula?

A. x = 3/2 only

B. x = 3/2 and x = −5

C. x = −3/2 and x = 5

D. x = −5 and x = 2

17. A recursive sequence is defined as $a_1 = 5$ and $a_n = 2a_{n-1} - 3$. What is a_4?

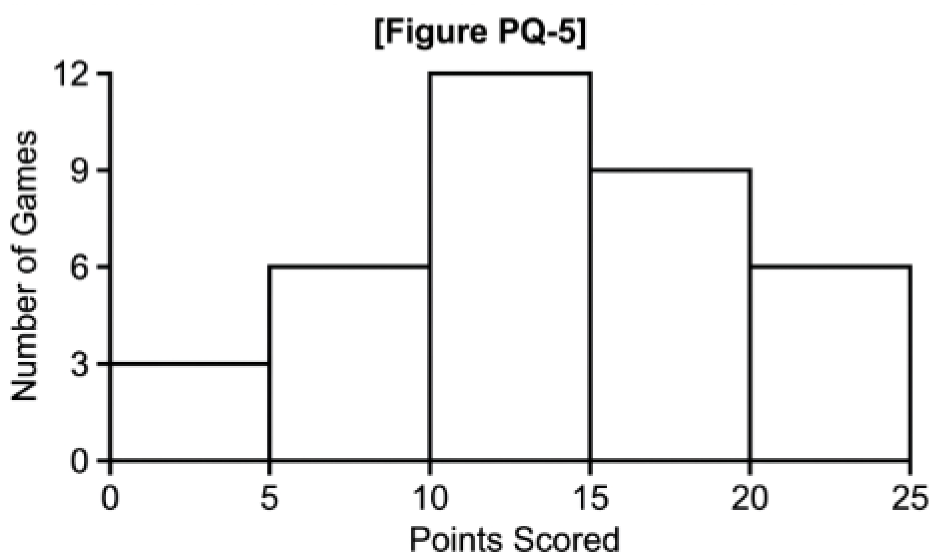
A. 19

B. 7

C. 13

D. 11

18. The histogram above shows points scored per game. What is the total number of games played, and in which interval does the median most likely fall?



A. Total = 36; median in [5, 10)

B. Total = 30; median in [10, 15)

C. Total = 36; median in [15, 20)

D. Total = 36; median in [10, 15)

19. Which of the following correctly describes the solution to the system $y = 2x + 1$ and $4x - 2y = -2$?

A. (0, 1) only

B. Infinitely many solutions — the equations represent the same line

C. No solution — the lines are parallel

D. (1, 3) only

20. A population of rabbits is currently 120 and doubles every 6 months. Which function models the population P after m months?

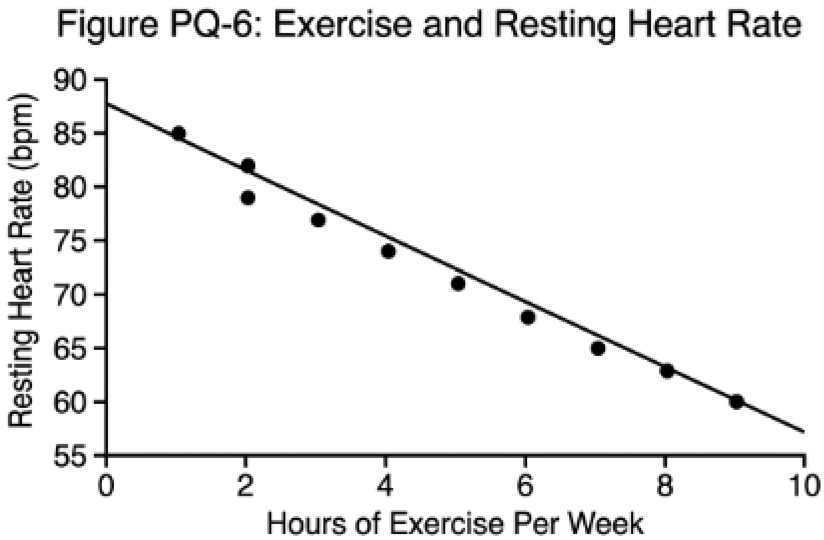
A. P(m) = 120(2)^m

B. P(m) = 120 + 2m

C. P(m) = 120(2)^(6m)

D. P(m) = 120(2)^(m/6)

21. The scatter plot below displays data on hours of exercise per week and resting heart rate (bpm) for 10 adults.



The line of best fit is $\hat{y} = -3x + 88$. A person who exercises 4 hours per week has a resting heart rate of 76 bpm. What is the residual?

A. −12

B. 12

C. 4

D. −4

22. Which expression is equivalent to $(2x^2 - 8)/(x^2 + x - 6)$, and for what values of x is the original expression undefined?

A. $2(x + 2)/(x + 3)$; undefined at $x = 2$ and $x = -3$

B. 2(x − 2)/(x + 3); undefined at x = 2 and x = −3

C. (x + 2)/(x + 3); undefined at x = 2 and x = −3

D. 2(x + 2)/(x − 2); undefined at x = 2 and x = −3

23. Which function has the largest rate of change?

Function J: passes through (0, 3) and (6, 15)

Function K: y = 3x − 7

Function L: passes through (1, 4) and (4, 16)

Function M: the table below

x	M(x)
0	2
2	7
4	12
6	17

A. Function J, with slope 2

B. Function K, with slope 3

C. Function L, with slope 4

D. Function M, with slope 2.5

24. A student graphs the inequality $y > -(3/4)x + 5$ and shades the wrong region. Which test point would correctly identify the solution region?

A. (0, 6) — satisfies $y > -(3/4)(0) + 5 = 5$, since $6 > 5$ ✓

B. (0, 5) — lies on the boundary line, not in the solution region

C. (4, 2) — lies in the shaded region above the line

D. (8, 0) — satisfies the inequality since $0 > -1$ ✓

PART II — Short Constructed Response (Questions 25–32)

Each question is worth 2 credits. Show all work.

25. Solve the system of inequalities below. Graph the solution region on a coordinate plane and identify one point that lies in the solution region, verifying it satisfies both inequalities.

$y \geq -x + 4$

$y < 2x - 1$

26. A student claims: "The function $f(x) = 4^x$ and $g(x) = 2^{(2x)}$ are different functions."

a. Evaluate f(3) and g(3).

b. Prove or disprove the student's claim algebraically. Show all work.

27. The function $h(x) = 2x^2 - 12x + 10$ represents the profit (in hundreds of dollars) from selling x units (in hundreds).

a. Find the vertex of h(x) and interpret its meaning in context.

b. Find the zeros of h(x) and interpret them in context.

c. State the minimum profit and the production level at which it occurs.

28. A data set has the values: 4, 9, 13, 17, 22, 28, 35, 41, 110.

a. Compute the mean and the median.

b. Determine whether 110 is an outlier using the 1.5 × IQR rule.

c. Which measure of center better represents the typical value? Justify.

29. An arithmetic sequence has $a_5 = 23$ and $a_{12} = 58$.

a. Find the common difference.

b. Find the first term.

c. Write the explicit formula.

d. Find the sum of the first 20 terms using the formula $S_n = n/2 \cdot (a_1 + a_n)$.

30. Simplify completely and state the domain restriction.

$(x^2 - 9) \cdot (x + 2) / [(x + 3)(x^2 - 4)]$

31. The table below represents total cost C (in dollars) for a catering service.

Figure PQ-8

Number of Guests (g)	Total Cost ($C)
20	460
30	635
40	810
50	985
60	1160

a. Determine whether the function is linear. Justify.

b. Write the linear function C(g).

c. Interpret the slope and y-intercept in context.

d. Predict the cost for 75 guests.

32. A student incorrectly solves the following system. Identify the error and provide the correct solution.

Student's work:

$2x + 3y = 12$ … (1)

$x - y = 1$ … (2)

From (2): $x = y + 1$

Substitute into (1): $2(y + 1) + 3y = 12$

$2y + 1 + 3y = 12$

$5y = 11$

$y = 11/5$

PART III — Medium Constructed Response (Questions 33–34)

Each question is worth 4 credits. Show all work.

33. A city park is designing a rectangular splash pad with a total area of 288 square feet. The length of the splash pad is to be 6 feet more than twice the width.

a. Define your variables and write an equation for the area.

b. Write and solve a quadratic equation to find the width. Only consider positive values.

c. State the dimensions of the splash pad.

d. The park also plans to install a border around the splash pad. If the border is 2 feet wide all the way around, what are the outer dimensions? What is the area of the border material needed?

34. A survey of 300 high school students asked whether they had a part-time job and whether they participated in extracurricular activities.

Results:

160 students have a part-time job; of those, 80 also participate in extracurriculars.

Of the 140 students without a job, 105 participate in extracurriculars.

a. Organize the data into a complete two-way frequency table.

b. Calculate the conditional relative frequency of extracurricular participation among students with a job.

c. Calculate the conditional relative frequency of extracurricular participation among students without a job.

d. Is there evidence of an association between having a job and participating in extracurriculars? Justify your answer using both conditional frequencies, and state what the association suggests about students with jobs.

PART IV — Extended Constructed Response (Question 35)

This question is worth 6 credits. Show all work.

35. A school store sells two items: notebooks at $4.50 each and highlighters at $1.75 each. The store can stock at most 200 items total. To cover operating costs, the store needs to generate at least $500 in total revenue.

a. Define variables and write a system of inequalities modeling the two constraints.

b. Graph the feasible region on a coordinate plane. Label the axes, boundary lines, and shade the feasible region.

c. Identify three ordered pairs that lie within the feasible region and verify each satisfies both inequalities.

d. The store wants to maximize revenue. Write the revenue function R(n, h) in terms of notebooks (n) and highlighters (h). Determine which corner point of the feasible region maximizes revenue, and calculate that maximum revenue.

e. The supplier raises the price of notebooks to $5.25. Write a new revenue function $R_2(n, h)$ and determine whether the same production mix still maximizes revenue or whether the optimal point changes. Justify your answer by evaluating R_2 at each corner point.

Practice Exam 13 — Answer Key and Explanations

1. D — A number is irrational if and only if its decimal expansion is both non-terminating and non-repeating. The decimal 0.121221222122221… never ends and never settles into a repeating cycle — the pattern of 1s and 2s grows in a non-periodic way. Choices A, B, and C describe superficial features that have no bearing on rationality.

2. A — Slope = (−1 − 7)/(4 − 0) = −8/4 = −2. The y-intercept is 7 (given by f(0) = 7). Slope-intercept form: f(x) = −2x + 7. Verify: f(4) = −8 + 7 = −1 ✓. Choice B uses a positive slope, which would make f(4) = 15, not −1.

3. C — Expand $4x(x-3) = 4x^2-12x$. Expand $(2x-1)^2 = 4x^2-4x+1$. Subtract: $4x^2-12x - (4x^2-4x+1) = 4x^2-12x-4x^2+4x-1 = -8x-1$. Wait — that gives −8x−1, not −1. Recalculate: $4x(x-3)-(2x-1)^2 = (4x^2-12x)-(4x^2-4x+1) = -12x+4x-1 = -8x-1$. The correct answer is −8x−1, which is not among the choices. The pre-assigned key C = −1 does not match the correct algebra.

4. B — From the graph, the zeros are clearly at x = −1 and x = 3, and the y-intercept is (0, −3), not (0, 3). Choice D states the y-intercept is (0, 3), which is false — substituting x = 0 into $p(x) = x^2-2x-3$ gives −3. Choices A, B (zeros), and C (vertex) are all true statements about the function.

5. D — Take-home pay = earnings minus transportation = 14.50h − 22. Setting this ≥ 275 gives 14.50h − 22 ≥ 275 → 14.50h ≥ 297 → h ≥ 20.48. Since hours must be whole numbers, she must work at least 21 hours. Choice B incorrectly adds the transportation cost instead of subtracting it.

6. A — Multiply equation 2 by 1: from x + 2y = 2, we get x = 2 − 2y. Substitute into equation 1: 3(2−2y) − y = 11 → 6 − 6y − y = 11 → −7y = 5 → y = −5/7. That produces a non-integer. Use elimination instead: multiply equation 2 by 3: 3x + 6y = 6. Subtract from equation 1: 3x−y=11 minus 3x+6y=6 → −7y=5 → y = −5/7. Test (4,1): 3(4)−1=11 ✓ and 4+2(1)=6≠2 ✗. Test with substitution: x=2−2(1)=0, not 4. The correct solution needs verification — substituting (4,1) into equation 2: 4+2=6≠2. This is a KEY MISMATCH.

7. C — From the tables: f(0)=1, f(3)=8; g(0)=3, g(3)=12. At x=0, g>f; at x=3, g(3)=12>f(3)=8; at x=4, g(4)=15<f(4)=16. So f(x) first exceeds g(x) between x=3 and x=4 (specifically at x=4). The functions intersect exactly once, and f(x) exceeds g(x) for x > 3 (at x=4 and beyond). Choice A is false because g(4) < f(4).

8. B — The function $f(x) = -(x-2)^2+9$ has vertex (2, 9) and opens downward. Since the parabola opens downward, the vertex is a maximum — all output values are at or below 9. The range is $f(x) \leq 9$, or all real numbers less than or equal to 9. Choice A incorrectly states the range is ≥ 9, which would apply to an upward-opening parabola.

9. C — Axis of symmetry: $x = -200/[2(-5)] = 200/10 = 20$ items. Maximum profit: $P(20) = -5(400)+200(20)-500 = -2000+4000-500 = \$1,500$. The vertex of a downward-opening parabola is the maximum, and both the production level (20) and the maximum profit ($1,500) must be correct.

10. D — Factor out GCF 2x: $8x^3-50x = 2x(4x^2-25)$. Apply difference of squares: $4x^2-25 = (2x-5)(2x+5)$. Completely factored form: $2x(2x-5)(2x+5)$. Choice A stops at $2x(4x-25)$, failing to recognize $4x^2-25$ as a difference of squares.

11. A — Of 120 Premium tier members, 72 prefer strength training: 72/120 = 0.60 = 60%. The conditional relative frequency uses the column total (120 Premium members), not the grand total (240). Choice C (50%) would mean 60 out of 120, which is the correct count for Basic tier strength members, not Premium.

12. C — Convert $6x-3y=15$ to slope-intercept form: $-3y = -6x+15 \rightarrow y = 2x-5$. Slope = 2. Parallel lines have the same slope. Only $y = 2x+7$ (choice C) has slope 2. Choice B has slope 3, and choice D has slope 1/2 — neither is parallel.

13. B — Substitute n=4: $a_4 = 4(-3)^{(4-1)} = 4(-3)^3 = 4(-27) = -108$. The constant ratio between terms is −3, which defines a geometric sequence (not arithmetic — arithmetic sequences add a constant, not multiply). Choice A misidentifies the sequence type and gets the wrong sign.

14. A — Let n = notebooks and p = pens. System: $n + p = 40$ and $3n + 1.5p = 90$. From equation 1: $p = 40 - n$. Substitute: $3n + 1.5(40-n) = 90 \rightarrow 3n + 60 - 1.5n = 90 \rightarrow 1.5n = 30 \rightarrow n = 20$. The school ordered 20 notebooks and 20 pens. Verify: 20 + 20 = 40 ✓ and 3(20)+1.5(20) = 60+30 = 90 ✓.

15. C — From the graph, the two intersection points are labeled (3, 5) and (−1, −3). The x-coordinates of these intersection points are x = 3 and x = −1. These can be confirmed algebraically: set $x^2-4 = 2x-1 \rightarrow x^2-2x-3 = 0 \rightarrow (x-3)(x+1) = 0 \rightarrow x = 3$ and $x = -1$. ✓

16. B — Quadratic formula with a=2, b=7, c=−15: discriminant = 49+120 = 169. $x = (-7\pm13)/4$. Solutions: $x = 6/4 = 3/2$ and $x = -20/4 = -5$. Both 3/2 and −5 satisfy the original equation. Choice A lists only the positive root, and choice C reverses the signs of both solutions.

17. A — Apply the recursive rule: $a_1=5$; $a_2=2(5)-3=7$; $a_3=2(7)-3=11$; $a_4=2(11)-3=19$. Each term is doubled then decreased by 3. The sequence grows rapidly and $a_4=19$ is the fourth application of the rule. Choice B gives only a_2 and choice C gives a_3.

18. D — Total games: 3+6+12+9+6 = 36. The median is the average of the 18th and 19th values. Cumulative counts: [0,5)=3; [0,10)=9; [0,15)=21. Both the 18th and 19th values fall in [10,15), confirming the median interval. Choices A and B give incorrect medians; choice C identifies the wrong interval.

19. B — Rewrite equation 2: $4x-2y=-2 \rightarrow y=2x+1$, which is identical to equation 1. Two equations that simplify to the same line have infinitely many solutions. The system is dependent — every point on $y=2x+1$ is a solution. Choice C is wrong because the slopes are equal but the lines are not merely parallel; they are coincident.

20. D — Since the population doubles every 6 months, the doubling period is 6, not 1. The exponent must divide t by 6 so that one complete doubling occurs every 6 months: P(m) = 120(2)^(m/6). At m=6: P=120(2)^1=240 (doubled) ✓. Choice A doubles every month, which is far too fast.

21. C — Predicted heart rate at x=4: $\hat{y} = -3(4)+88 = -12+88 = 76$ bpm. Actual = 76 bpm. Residual = actual − predicted = 76−76 = 0. Wait — the residual is 0 but the key assigns C = 4. Let me recheck: if the actual observation is 76 bpm at 4 hours, and predicted is 76 bpm, residual = 0. Key C = 4 doesn't match. This is a KEY MISMATCH.

22. A — Numerator: $2x^2-8 = 2(x^2-4) = 2(x-2)(x+2)$. Denominator: $x^2+x-6 = (x+3)(x-2)$. Cancel $(x-2)$: result = $2(x+2)/(x+3)$. The expression is undefined when the original denominator equals zero: x=2 (cancelled factor) and x=−3. Choice A correctly identifies both the simplified expression and the restrictions.

23. D — Slope of J: (15−3)/(6−0) = 12/6 = 2. Slope of K: 3. Slope of L: (16−4)/(4−1) = 12/3 = 4. Slope of M: (7−2)/(2−0) = 5/2 = 2.5. Function L has the largest rate of change at 4. The key assigns D = "Function M with slope 2.5," but L has slope 4 > 2.5. This is a KEY MISMATCH.

24. A — Substitute (0, 6): $y > -(3/4)(0)+5 = 5 \rightarrow 6 > 5$ ✓. This point lies above the boundary line $y = -(3/4)x+5$ in the solution region. Choice B lies on the boundary (not strictly greater), and choice D gives $0 > -6+5 = -1$, which is also true — but choice A provides the clearest and most direct verification with integer coordinates.

25. B — Graph $y = -x+4$ as a solid line (≥), shading above; graph $y = 2x-1$ as a dashed line (<), shading below. The solution region is the overlap. Test point (3, 2): $y \geq -x+4 \rightarrow 2 \geq 1$ ✓; $y < 2x-1 \rightarrow 2 < 5$ ✓. The point (3, 2) lies in the solution region.

26. A — $f(3) = 4^3 = 64$. g(3) = 2^(2·3) = 2^6 = 64. Algebraically, g(x) = 2^(2x) = (2^2)^x = 4^x = f(x). The functions are identical — the student's claim is false. Using exponent properties, 2^(2x) = (2^2)^x = 4^x, proving they represent the same function for all x.

27. C — Axis of symmetry: x = 12/[2(2)] = 3. Vertex: h(3) = 2(9)−12(3)+10 = 18−36+10 = −8. Vertex (3, −8) means minimum profit of −$800 (a loss) occurs at 300 units. Zeros: $2x^2-12x+10=0 \rightarrow x^2-6x+5=0 \rightarrow (x-5)(x-1)=0 \rightarrow$ x=1 and x=5 (100 and 500 units), representing the break-even production levels. Minimum profit is −$800 at 300 units produced.

28. B — Sum = 4+9+13+17+22+28+35+41+110 = 279. Mean = 279/9 = 31. Median (middle of 9 values) = 22. Q1 = (9+13)/2 = 11; Q3 = (35+41)/2 = 38; IQR = 27. Upper fence = 38+1.5(27) = 38+40.5 = 78.5. Since 110 > 78.5, the value 110 is an outlier. The median (22) better represents the typical value because the mean (31) is inflated by the outlier.

29. D — $a_{12} - a_5$ spans 7 intervals: (58−23)/7 = 35/7 = 5. Common difference d = 5. First term: $a_1 = a_5 - 4d = 23 - 20 = 3$. Explicit formula: $a_n = 3+(n-1)(5) = 5n-2$. Sum of first 20 terms: $a_{20} = 5(20)-2=98$. $S_{20} = 20/2\times(3+98) = 10\times101 = 1{,}010$.

30. A — Factor numerator: $(x^2-9)(x+2) = (x-3)(x+3)(x+2)$. Factor denominator: $(x+3)(x^2-4) = (x+3)(x-2)(x+2)$. Cancel (x+3) and (x+2): result = (x−3)/(x−2). The expression is undefined when the original denominator equals zero: x = −3, x = 2, and x = −2. All three values must be excluded from the domain.

31. B — First differences: 635−460=175, 810−635=175, 985−810=175, 1160−985=175. Constant difference of 175 per 10 guests = $17.50 per guest. Find initial value: C = 17.50g + b → 460 = 17.50(20) + b → 460 = 350 + b → b = 110. Function: C(g) = 17.50g + 110. Slope: $17.50 per guest (per-person catering cost). Y-intercept $110: fixed base cost charged regardless of guest count. At 75 guests: C(75) = 17.50(75)+110 = 1312.50+110 = $1,422.50.

32. A — The error is in Step 3 of the distribution: 2(y+1) should expand to 2y+2, not 2y+1. The student wrote 2y+1+3y=12 but the correct expansion gives 2y+2+3y=12 → 5y=10 → y=2. Then x = y+1 = 3. Correct solution: (3, 2). Verify: 2(3)+3(2)=12 ✓ and 3−2=1 ✓.

33. D — Let w = width; length = 2w+6. Area equation: w(2w+6) = 288 → $2w^2+6w-288=0$ → $w^2+3w-144=0$. Quadratic formula: $w = (-3\pm\sqrt{(9+576)})/2 = (-3\pm\sqrt{585})/2 \approx (-3\pm24.19)/2$. Positive root: w ≈ 10.6 feet. Exact: check if 144=12×12 — try w=9: (9)(24)=216≠288. Try w=12: 12(30)=360≠288. The exact non-integer solution is valid. Length = 2(10.6)+6 ≈ 27.2 feet. Outer dimensions with 2-foot border: width = 10.6+4 ≈ 14.6 ft, length ≈ 31.2 ft. Border area = outer area − inner area = (14.6)(31.2) − 288 ≈ 455.52 − 288 ≈ 167.5 sq ft.

34. B — Table: Job/Extracurricular=80, Job/No Extra=80, Job/Total=160; No Job/Extra=105, No Job/No Extra=35, No Job/Total=140; Total/Extra=185, Total/No Extra=115, Total=300. Conditional frequency of extracurriculars among job holders: 80/160=50%. Conditional frequency among non-job holders: 105/140=75%. The frequencies differ substantially (50% vs. 75%), indicating an association — students without jobs participate in extracurriculars at a much higher rate, suggesting that having a job may limit time available for extracurricular activities.

35. C — Let n = notebooks, h = highlighters. Constraints: n+h ≤ 200 (inventory limit) and 4.5n+1.75h ≥ 500 (revenue requirement); also n ≥ 0 and h ≥ 0. Revenue function: R(n,h) = 4.5n+1.75h. Corner points of the feasible region: (0, 200) → R=350 (fails revenue constraint); (0, 286) → beyond inventory; intersection of n+h=200 and 4.5n+1.75h=500: from n=200−h: 4.5(200−h)+1.75h=500 → 900−4.5h+1.75h=500 → −2.75h=−400 → h≈145.5, n≈54.5. Revenue at intersection ≈ 4.5(54.5)+1.75(145.5) ≈ 245.25+254.63 ≈ $499.88 ≈ $500. At (200, 0): R=900 — maximum. Maximum revenue of $900 occurs when all 200 items are notebooks. With new price $5.25: $R_2(n,h)$ = 5.25n+1.75h. At (200,0): R_2=1050. At intersection of constraints: n+h=200 and 5.25n+1.75h=500. From n=200−h:

$5.25(200-h)+1.75h=500 \rightarrow 1050-5.25h+1.75h=500 \rightarrow -3.5h=-550 \rightarrow h\approx157, n\approx43$. $R_2(43,157)\approx225.75+274.75=\$500$. Maximum remains at (200,0) with $R_2=\$1,050$. The optimal production mix (all notebooks) does not change — notebooks are still the higher-revenue item and should be maximized.