Integrated Algebra
Review Booklet

Instructions to students and parents: This booklet is intended to help you practice for the *Integrated Algebra* Regents exam. It contains 51 algebra questions from previous years' Regents exams, which reflect work that you have done throughout this year. There are two types of questions. Multiple-choice are questions which you must answer by choosing the correct one among four possible answers, labeled A, B, C, and D. Multiple-choice questions on the exam are worth two points each, with no partial credit given. The second type is called constructed-response, in which you must come up with the answer yourself. Constructed-response questions on the exam can be worth two, three or four points, depending on how much work is involved in solving them. They are scored by your teachers using a **rubric**, which describes how many points a particular answer is worth. It is very important that you show **all** your work, since this type of question can earn you partial credit. The answer key which accompanies this booklet provides rubrics for all of the constructed-response questions in the booklet, so you can see what a rubric looks like and how it can be used to award points.

The best way to practice for the Regents exam would be to work on ten problems in this booklet per day. The questions are taken from a website www.jmap.org where many more practice problems are available. We have attached a formula and reference sheet at the back of this booklet, just like the one you will be provided with during the actual *Integrated Algebra* Regents exam. Good luck with your practice and on the exam!

Integrated Algebra Regents Exam Questions at Random Worksheet # 1 NAME:_____
www.jmap.org

1. 060839ia, P.I. A.S.4
The prices of seven race cars sold last week are listed in the table below.

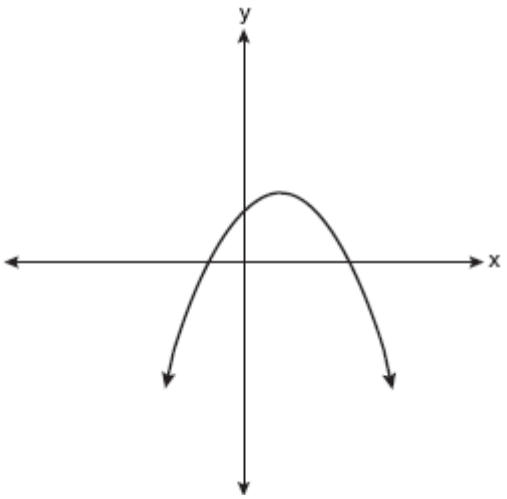
Price per Race Car	Number of Race Cars
$126,000	1
$140,000	2
$180,000	1
$400,000	2
$819,000	1

What is the mean value of these race cars, in dollars? What is the median value of these race cars, in dollars? State which of these measures of central tendency best represents the value of the seven race cars. Justify your answer.

2. 080833ia, P.I. A.A.30
Twelve players make up a high school basketball team. The team jerseys are numbered 1 through 12. The players wearing the jerseys numbered 3, 6, 7, 8, and 11 are the only players who start a game. Using set notation, list the complement of this subset.

3. 010936ia, P.I. A.G.2
A soup can is in the shape of a cylinder. The can has a volume of $342\,cm^3$ and a diameter of 6 cm. Express the height of the can in terms of π. Determine the maximum number of soup cans that can be stacked on their base between two shelves if the distance between the shelves is exactly 36 cm. Explain your answer.

4. fall0717ia, P.I. A.G.4
Which type of graph is shown in the diagram below?



[A] exponential [B] absolute value
[C] linear [D] quadratic

5. fall0731ia, P.I. A.N.2
Express $5\sqrt{72}$ in simplest radical form.

6. 080808ia, P.I. A.A.23
If $3ax + b = c$, then x equals

[A] $c + b - 3a$ [B] $\frac{c-b}{3a}$

[C] $\frac{b-c}{3a}$ [D] $c - b + 3a$

7. 060808ia, P.I. A.N.8
The bowling team at Lincoln High School must choose a president, vice president, and secretary. If the team has 10 members, which expression could be used to determine the number of ways the officers could be chosen?

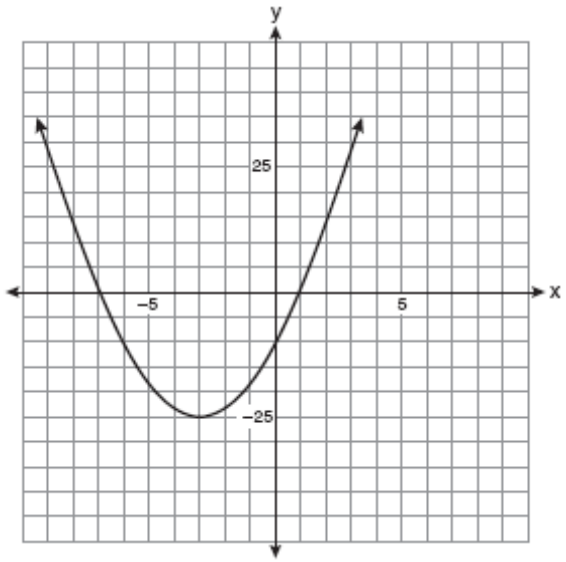
[A] ${}_{10}P_7$ [B] ${}_{10}P_3$ [C] ${}_{7}P_3$ [D] ${}_{3}P_{10}$

8. 060810ia, P.I. A.A.11
Which ordered pair is a solution to the system of equations $y = x$ and $y = x^2 - 2$?

[A] (-2, -2) [B] (0, 0)

[C] (-1, 1) [D] (2, 2)

9. 010916ia, P.I. A.G.10
Which equation represents the axis of symmetry of the graph of the parabola below?



[A] x = -3 [B] x = -25

[C] y = -3 [D] y = -25

10. fall0714ia, P.I. A.S.2
Which situation should be analyzed using bivariate data?

[A] Ms. Saleem keeps a list of the amount of time her daughter spends on her social studies homework.

[B] Mr. DeStefan records his customers' best video game scores during the summer.

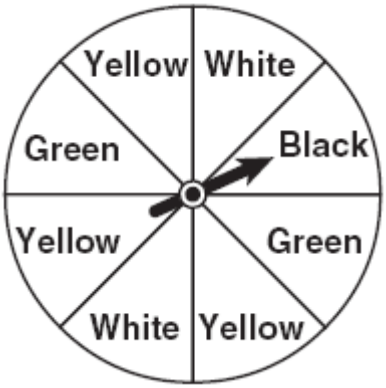
[C] Mr. Benjamin tries to see if his students' shoe sizes are directly related to their heights.

[D] Mr. Chan keeps track of his daughter's algebra grades for the quarter.

11. 010902ia, P.I. A.M.1
What is the speed, in meters per second, of a paper airplane that flies 24 meters in 6 seconds?

[A] 18 [B] 30 [C] 4 [D] 144

12. 060802ia, P.I. A.S.22
A spinner is divided into eight equal regions as shown in the diagram below.



Which event is most likely to occur in one spin?

[A] The arrow will land in a yellow or black area.

[B] The arrow will land in a green or black area.

[C] The arrow will land in a green or white area.

[D] The arrow will land in a yellow or green area.

13. 010908ia, P.I. A.A.9
The New York Volleyball Association invited 64 teams to compete in a tournament. After each round, half of the teams were eliminated. Which equation represents the number of teams, *t*, that remained in the tournament after *r* rounds?

[A] $t = 64(r)^{0.5}$ [B] $t = 64(-0.5)^r$

[C] $t = 64(1.5)^r$ [D] $t = 64(0.5)^r$

14. 080819a, P.I. A.A.13
When $3g^2 - 4g + 2$ is subtracted from $7g^2 + 5g - 1$, the difference is

[A] $4g^2 + 9g - 3$ [B] $4g^2 + g + 1$

[C] $10g^2 + g + 1$ [D] $-4g^2 - 9g + 3$

15. 010925ia, P.I. A.A.15
The function $y = \frac{x}{x^2 - 9}$ is undefined when the value of *x* is

[A] -3, only [B] 3 or -3

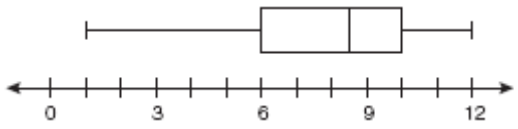
[C] 3, only [D] 0 or 3

16. fall0724ia, P.I. A.A.21
Which value of x is in the solution set of the inequality $-2x+5>17$?

[A] -8 [B] -6 [C] 12 [D] -4

17. fall0736ia, P.I. A.S.19
Mr. Laub has three children: two girls (Sue and Karen) and one boy (David). After each meal, one child is chosen at random to wash dishes. If the same child can be chosen for both lunch and dinner, construct a tree diagram or list a sample space of all the possible outcomes of who will wash dishes after lunch and dinner on Saturday. Determine the probability that one boy and one girl will wash dishes after lunch and dinner on Saturday.

18. 080818ia, P.I. A.S.6
What is the value of the third quartile shown on the box-and-whisker plot below?



[A] 6 [B] 12 [C] 10 [D] 8.5

19. 010918ia, P.I. A.A.26
What is the value of x in the equation $\frac{2}{x}-3=\frac{26}{x}$?

[A] -8 [B] 8 [C] $-\frac{1}{8}$ [D] $\frac{1}{8}$

20. 010927ia, P.I. A.N.4
What is the product of 8.4×10^{8} and 4.2×10^{3} written in scientific notation?

[A] 12.6×10^{11} [B] 35.28×10^{11}

[C] 2.0×10^{5} [D] 3.528×10^{12}

21. 060809ia, P.I. A.G.2
Lenny made a cube in technology class. Each edge measured 1.5 cm. What is the volume of the cube in cubic centimeters?

[A] 2.25 [B] 13.5 [C] 3.375 [D] 9.0

22. 060822ia, P.I. A.S.9
The table below shows a cumulative frequency distribution of runners' ages.

Cumulative Frequency Distribution of Runners' Ages

Age Group	Total
20–29	8
20–39	18
20–49	25
20–59	31
20–69	35

According to the table, how many runners are in their forties?

[A] 25 [B] 6 [C] 7 [D] 10

23. 080825ia, P.I. A.A.40
Which ordered pair is in the solution set of the following system of inequalities?

$$y < \frac{1}{2}x + 4$$
$$y \geq -x + 1$$

[A] (0, 4) [B] (3, -5)
[C] (-5, 3) [D] (4, 0)

24. 080831a, P.I. A.M.1
In a game of ice hockey, the hockey puck took 0.8 second to travel 89 feet to the goal line. Determine the average speed of the puck in feet per second.

25. 060812ia, P.I. A.A.7
Pam is playing with red and black marbles. The number of red marbles she has is three more than twice the number of black marbles she has. She has 42 marbles in all. How many red marbles does Pam have?

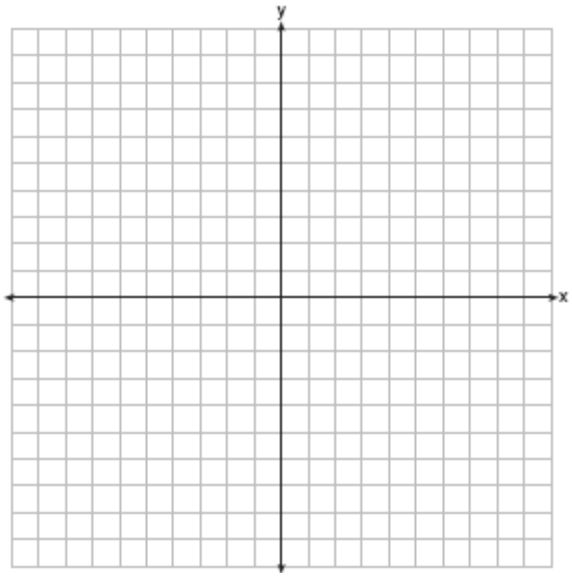
[A] 13 [B] 29 [C] 15 [D] 33

26. 010914ia, P.I. A.A.28
What are the roots of the equation $x^2 - 10x + 21 = 0$?

[A] 3 and 7 [B] -5 and -5
[C] 1 and 21 [D] -3 and -7

27. 010938ia, P.I. A.G.7
On the set of axes below, graph the following system of inequalities and state the coordinates of a point in the solution set.

$$2x - y \geq 6$$
$$x > 2$$



28. 010911ia, P.I. A.A.23
If the formula for the perimeter of a rectangle is $P = 2l + 2w$, then w can be expressed as

[A] $w = \frac{P - l}{2}$ [B] $w = \frac{P - 2l}{2}$

[C] $w = \frac{2l - P}{2}$ [D] $w = \frac{P - 2w}{2l}$

29. 010924ia, P.I. A.A.1
The length of a rectangular room is 7 less than three times the width, w, of the room. Which expression represents the area of the room?

[A] $3w - 4$ [B] $3w^2 - 7w$

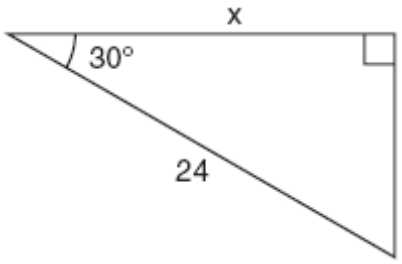
[C] $3w^2 - 4w$ [D] $3w - 7$

30. 080823a, P.I. A.A.32
In a linear equation, the independent variable increases at a constant rate while the dependent variable decreases at a constant rate. The slope of this line is

[A] positive [B] zero

[C] negative [D] undefined

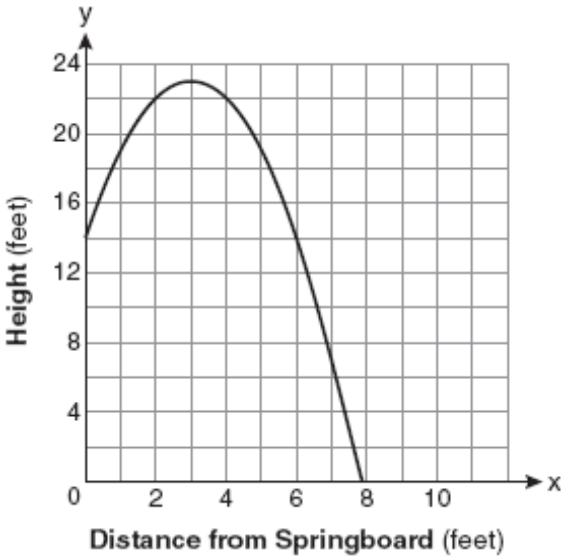
31. 010912ia, P.I. A.A.44
In the right triangle shown in the diagram below, what is the value of x to the *nearest whole number*?



[A] 21 [B] 12 [C] 28 [D] 14

32. 080813ia, P.I. A.G.10

A swim team member performs a dive from a 14-foot-high springboard. The parabola below shows the path of her dive.



Which equation represents the axis of symmetry?

[A] $x = 3$ [B] $x = 23$

[C] $y = 23$ [D] $y = 3$

33. 080801ia, P.I. A.A.22

Which value of p is the solution of $5p - 1 = 2p + 20$?

[A] 3 [B] $\frac{19}{7}$ [C] 7 [D] $\frac{19}{3}$

34. fall0739ia, P.I. A.A.26

Solve for x: $\frac{x+1}{x} = \frac{-7}{x-12}$

35. 010910ia, P.I. A.A.35

What is an equation of the line that passes through the points $(3,-3)$ and $(-3,-3)$?

[A] $y = -3$ [B] $y = 3$

[C] $x = -3$ [D] $x = y$

36. fall0725ia, P.I. A.N.4

What is the quotient of 8.05×10^6 and 3.5×10^2?

[A] 2.3×10^8 [B] 2.3×10^{12}

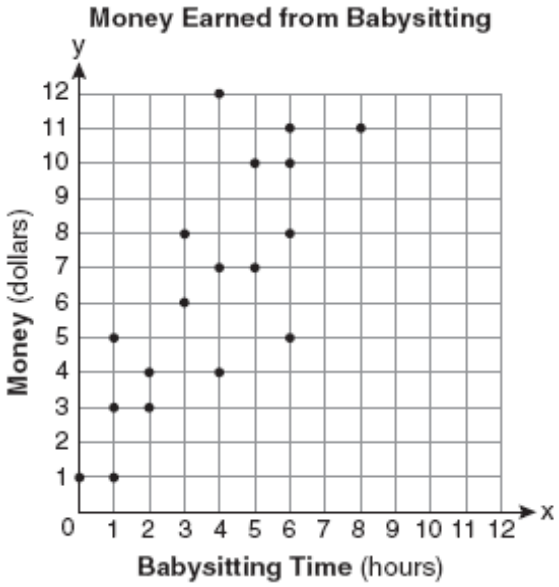
[C] 2.3×10^3 [D] 2.3×10^4

37. 080834ia, P.I. A.N.3

Express the product of $3\sqrt{20}(2\sqrt{5} - 7)$ in simplest radical form.

38. 080822ia, P.I. A.S.8

Which equation most closely represents the line of best fit for the scatter plot below?



[A] $y = \frac{3}{2}x + 1$ [B] $y = \frac{2}{3}x + 1$

[C] $y = x$ [D] $y = \frac{3}{2}x + 4$

39. 080809ia, P.I. A.A.45

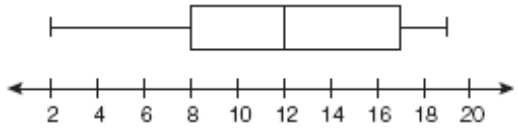
The length of the hypotenuse of a right triangle is 34 inches and the length of one of its legs is 16 inches. What is the length, in inches, of the other leg of this right triangle?

[A] 18 [B] 25 [C] 16 [D] 30

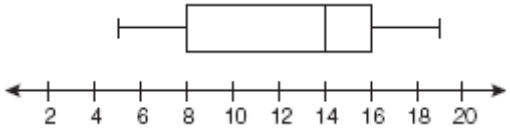
40. fall0709ia, P.I. A.S.5

The data set 5, 6, 7, 8, 9, 9, 9, 10, 12, 14, 17, 17, 18, 19, 19 represents the number of hours spent on the Internet in a week by students in a mathematics class. Which box-and-whisker plot represents the data?

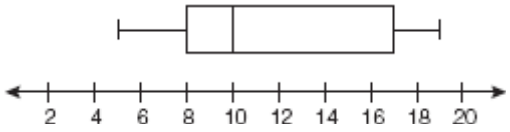
[A]



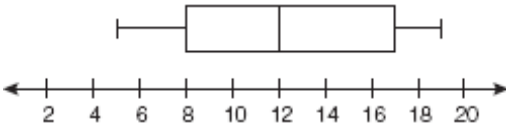
[B]



[C]



[D]



41. fall0708ia, P.I. A.A.7

The equations $5x + 2y = 48$ and $3x + 2y = 32$ represent the money collected from school concert ticket sales during two class periods. If x represents the cost for each adult ticket and y represents the cost for each student ticket, what is the cost for each adult ticket?

[A] $4 [B] $8 [C] $20 [D] $10

42. 010939ia, P.I. A.S.19

A restaurant sells kids' meals consisting of one main course, one side dish, and one drink, as shown in the table below.

Kids' Meal Choices

Main Course	Side Dish	Drink
hamburger	French fries	milk
chicken nuggets	applesauce	juice
turkey sandwich		soda

Draw a tree diagram or list the sample space showing all possible kids' meals. How many different kids' meals can a person order? Jose does not drink juice. Determine the number of different kids' meals that do *not* include juice. Jose's sister will eat *only* chicken nuggets for her main course. Determine the number of different kids' meals that include chicken nuggets.

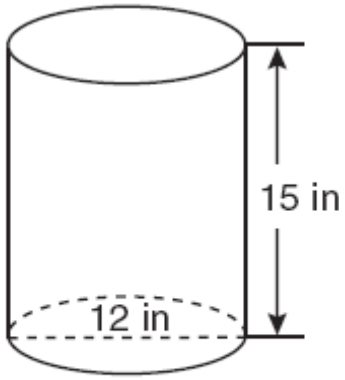
43. 010921ia, P.I. A.A.17

What is $\frac{6}{5x}-\frac{2}{3x}$ in simplest form?

[A] $\frac{8}{15x^2}$ [B] $\frac{8}{15x}$ [C] $\frac{4}{2x}$ [D] $\frac{4}{15x}$

44. fall0712ia, P.I. A.G.2

A cylindrical container has a diameter of 12 inches and a height of 15 inches, as illustrated in the diagram below.



(Not drawn to scale)

What is the volume of this container to the *nearest tenth* of a cubic inch?

[A] 2,160.0 [B] 6,785.8

[C] 1,696.5 [D] 4,241.2

45. 060813ia, P.I. A.A.12

What is half of 2^6?

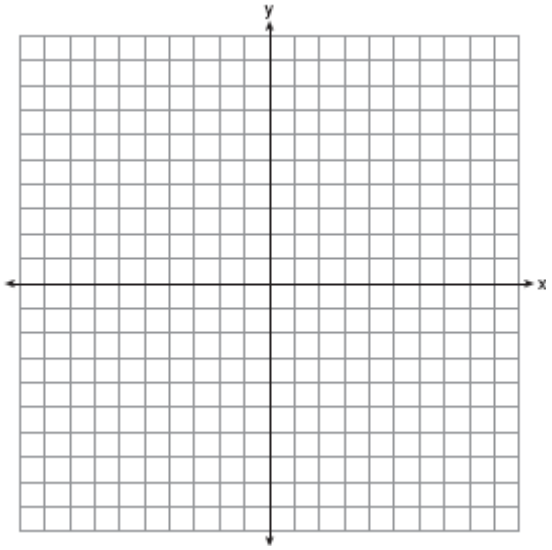
[A] 2^3 [B] 1^6 [C] 2^5 [D] 1^3

46. 080839ia, P.I. A.G.9

On the set of axes below, solve the following system of equations graphically and state the coordinates of all points in the solution set.

$$y = x^2 + 4x - 5$$

$$y = x - 1$$



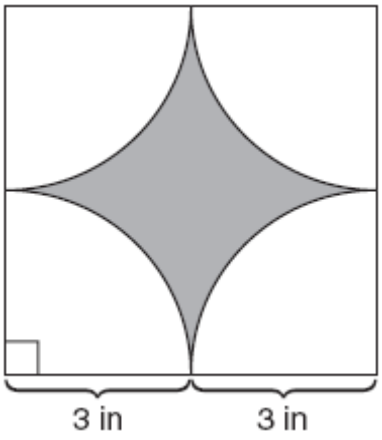
47. fall0704ia, P.I. A.A.29

Which interval notation represents the set of all numbers from 2 through 7, inclusive?

[A] (2,7) [B] [2,7] [C] (2,7] [D] [2,7)

48. 060832ia, P.I. A.G.1

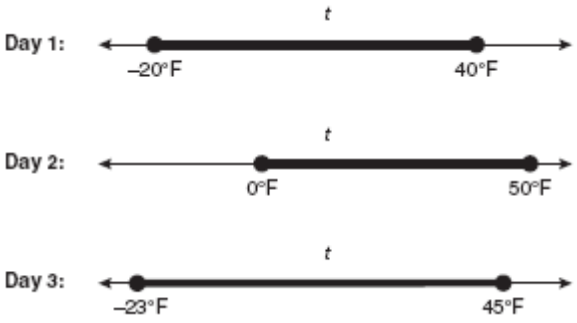
A designer created the logo shown below. The logo consists of a square and four quarter-circles of equal size.



Express, in terms of π, the exact area, in square inches, of the shaded region.

49. 060833ia, P.I. A.A.31

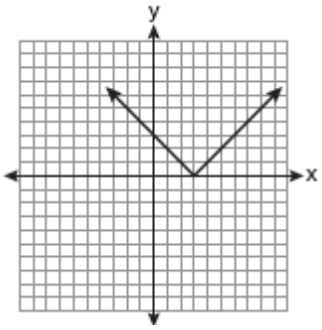
Maureen tracks the range of outdoor temperatures over three days. She records the following information.



Express the intersection of the three sets as an inequality in terms of temperature, *t*.

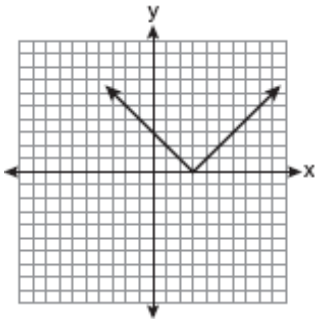
50. fall0722ia, P.I. A.G.4

The diagram below shows the graph of $y = |x - 3|$.

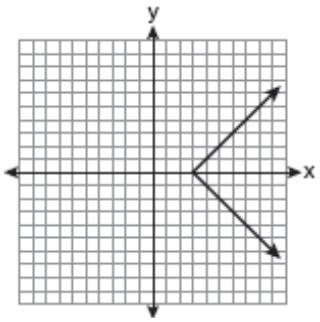


Which diagram shows the graph of $y = -|x - 3|$?

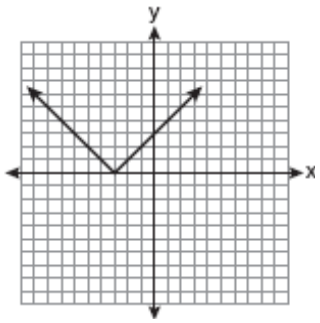
[A]



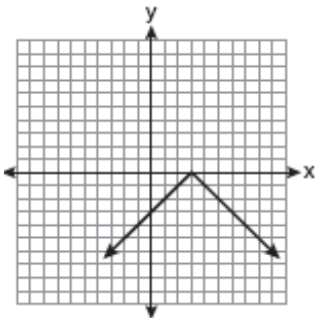
[B]



[C]



[D]



51. 010932ia, P.I. A.A.12

Simplify: $\dfrac{27k^5m^8}{(4k^3)(9m^2)}$

Reference Sheet

The Regents Examination in Integrated Algebra will include a reference sheet containing the formulas specified below.

Trigonometric Ratios	$\sin A = \frac{opposite}{hypotenuse}$ $\cos A = \frac{adjacent}{hypotenuse}$ $\tan A = \frac{opposite}{adjacent}$

Area	trapezoid	$A = \frac{1}{2}h(b_1+b_2)$

Volume	cylinder	$V = \pi r^2 h$

Surface Area	rectangular prism	$SA = 2lw + 2hw + 2lh$
	cylinder	$SA = 2\pi r^2 + 2\pi rh$

Formulas for Coordinate Geometry	$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$ $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

JEFFERSON MATH PROJECT REGENTS AT RANDOM-WS

The 4 NY Integrated Algebra Regents Exams
Fall, 2007-January, 2009
(Answer Key)

www.jmap.org

Dear Sir

I have to acknolege the reciept of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensible as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

[4] Mean=315,000, median=180,000, and the median is stated to be the best measure of central tendency, an appropriate justification is given, and appropriate work is shown.
[3] Appropriate work is shown, but one computational error is made, but an appropriate measure of central tendency is stated, and an appropriate justification is given.
or [3] Mean=315,000, median=180,000, and the median is stated to be the best measure of central tendency, but no further correct work is shown.
[2] Appropriate work is shown, but two computational errors are made, but an appropriate measure of central tendency is stated, and an appropriate justification is given.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] Appropriate work is shown to find mean=315,000 and median=180,000, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] Appropriate work is shown to find mean=315,000 or median=180,000, but no further correct work is shown.
or [1] Mean=315,000 and median=180,000, but no further correct work is shown, and no justification is given.
[0] Mean=315,000 or median=180,000, but no further correct work is shown, and no justification is given.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[1] obviously incorrect procedure.

[2] {1, 2, 4, 5, 9, 10, 12} or {$x|x$ = 1, 2, 4, 5, 9, 10, 12}
[1] 1, 2, 4, 5, 9, 10, 12, but set notation is not used.
or [1] Set notation is used and at least five correct numbers (but not the entire set) are written.
[0] Set notation is used, but fewer than five correct numbers are written.
or [0] {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[2] obviously incorrect procedure.

[3] $\frac{38}{\pi}$ or an equivalent answer in terms of π, and 2, and appropriate work is shown, and an appropriate explanation is given.
[2] Appropriate work is shown, but one computational or rounding error is made, but an appropriate explanation is given.
or [2] Appropriate work is shown and an appropriate explanation is given, but the correct height of the can is expressed as a decimal.
or [2] $\frac{38}{\pi}$ and 2, and appropriate work is shown, but an appropriate explanation is not given.
[1] Appropriate work is shown, but two or more computational or rounding errors are made, but an appropriate explanation is given.
[1] Appropriate work is shown, but one conceptual error is made, but an appropriate explanation is given.
or [1] $\frac{38}{\pi}$ and 2, but no work is shown.
[0] $\frac{38}{\pi}$ or 2, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[3] obviously incorrect procedure.

[4] D

[2] $30\sqrt{2}$, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but the answer is not in simplest radical form.
or [1] $30\sqrt{2}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[5]

[6] B

[7] B

[8] D

[9] A

[10] C

[11] C

[12] D

[13] D

[14] A

[15] B

[16] A

[3] $\frac{4}{9}$, and a correct tree diagram or sample space is shown.
[2] A correct tree diagram or sample space is shown, but no probability or an incorrect probability is given.
or [2] An incorrect tree diagram or sample space is shown, but an appropriate probability is found.
[1] Appropriate work is shown, but one conceptual error is made.
or [1] $\frac{4}{9}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[17]

[18] C

[19] A

[20] D

[21] C

[22] C

[23] D

[2] 111.25 or $111\frac{1}{4}$, and appropriate work is shown.
[1] Appropriate work is shown, but the answer is rounded.
or [1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] 111.25, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[24]

[25] B

[26] A

[4] Both inequalities are graphed and shaded correctly, and at least one is labeled, and a point in the solution set is identified.
[3] Appropriate work is shown, but one graphing error is made, such as drawing a solid line for $x > 2$ or shading incorrectly, but an appropriate point in the solution set is identified.
or [3] Both inequalities are graphed and shaded correctly, and a point in the solution set is identified correctly, but the graphs are not labeled or are labeled incorrectly.
or [3] Both inequalities are graphed and shaded correctly, and at least one is labeled, but no point in the solution set is identified.
[2] Appropriate work is shown, but two or more graphing errors are made, but an appropriate point in the solution set is identified.
or [2] Appropriate work is shown, but one conceptual error is made, such as graphing the lines $x = 2$ and $y = 2x - 6$ and identifying the point of intersection.
or [2] One of the inequalities is graphed and shaded correctly, and at least one is labeled, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one graphing error are made, but an appropriate point in the solution set is identified.
or [1] Both inequalities are graphed incorrectly, but an appropriate point in the solution set is identified.
or [1] The lines $x = 2$ and $y = 2x - 6$ are graphed correctly, and at least one is labeled, but no further correct work is shown.
or [1] A point in the solution set is identified and shown to be correct by checking in both inequalities, but no graphs are drawn.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[27]

[28] B

[29] B

[30] C

[31] A

[32] A

[33] C

[4] 6 and –2, and appropriate work is shown, such as an algebraic solution or trial and error with at least three trials and appropriate checks.
[3] Appropriate work is shown, but one computational or factoring error is made.
or [3] Appropriate work is shown, but only one solution is found.
[2] The correct quadratic equation is written in standard form.
or [2] Appropriate work is shown, but two or more computational or factoring errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] The trial-and-error method is used to find at least one solution, but only two trials and appropriate checks are shown.
or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.
or [2] An incorrect quadratic equation of equal difficulty is solved appropriately.
[1] $x^2 - 11x - 12 = -7x$, but no further correct work is shown.
or [1] 6 and -2, but no work or only one trial with an appropriate check is shown.
or [1] An incorrect equation of a lesser degree of difficulty is solved appropriately.
or [1] Appropriate work is shown, but one conceptual error and one computational or factoring error are made.
[0] 6 or -2, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[34]

[35] A

[36] D

[3] $60-42\sqrt{5}$, and appropriate work is shown.
[2] Appropriate work is shown, but one computational error is made.
or [2] Appropriate work is shown, but only one term is expressed in simplest radical form.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but the answer is expressed as a decimal.
or [1] The distributive property is correctly applied, yielding $6\sqrt{100}-21\sqrt{20}$, but no further correct work is shown.
or [1] $60-42\sqrt{5}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[37]

[38] A

[39] D

[40] C

[41] B

[4] A correct tree diagram or sample space is given, and 18 total meals, 12 meals without juice, and 6 meals with chicken nuggets.
[3] A correct tree diagram or sample space is given, but either 18, 12, or 6 is missing or is incorrect.
or [3] The fundamental counting principle is used to find 18 total meals, 12 meals without juice, and 6 meals with chicken nuggets, but no tree diagram or sample space is given.
or [3] An incorrect tree diagram or sample space is given, but an appropriate number of meals is found for all three categories.
[2] A correct tree diagram or sample space is given, but an appropriate number of meals is found for only one category.
or [2] An incorrect tree diagram or sample space is given, but an appropriate number of meals is found for only two categories.
[1] A correct tree diagram or sample space is given, but no number of meals is found correctly.
or [1] An incorrect tree diagram or sample space is given, but an appropriate number of meals is found for only one category.
or [1] 18 total meals, 12 meals without juice, and 6 meals with chicken nuggets, but no work is shown.
[0] 18 total meals or 12 meals without juice or 6 meals with chicken nuggets, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[42]

[43] B

[44] C

[45] C

[4] Appropriate graphs are drawn, and (1, 0) and (-4, -5) are stated.
[3] Appropriate work is shown, but one graphing error is made, but appropriate solutions are stated.
or [3] Both graphs are drawn correctly, but only one solution is stated.
[2] Appropriate work is shown, but two or more graphing errors are made, but appropriate solutions are stated.
or [2] Appropriate work is shown, but one conceptual error is made, such as graphing a line instead of a parabola, but appropriate solutions are stated.
or [2] Both graphs are drawn correctly, but no solutions are stated.
or [2] (1, 0) and (-4, -5) are found as the points of intersection, but a method other than graphic is used.
[1] Appropriate work is shown, but one conceptual error and one graphing error are made.
or [1] The system is solved algebraically for only the *x* values, *y* values, or the coordinates of one point.
or [1] One graph is drawn correctly, but no further correct work is shown.
or [1] (1, 0) and (-4, -5) are stated, but no work is shown.
[0] (1,0) or (-4, -5) is stated, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[46]

[47] B

[2] $36-9\pi$ or $36-3^2\pi$, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but the answer is not expressed in terms of π.
or [1] $36-9\pi$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[48]

[2] $0 \le t \le 40$ or an equivalent answer.
[1] Appropriate work is shown, but one conceptual error is made, such as $0 < t < 40$ or $-23 \le t \le 50$.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[49]

[50] D

[2] $\frac{3k^2m^6}{4}$ or an equivalent answer, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] $\frac{3k^2m^6}{4}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[51]

[52] D

JEFFERSON MATH PROJECT REGENTS AT RANDOM-WS

The 4 NY Integrated Algebra Regents Exams
Fall, 2007-January, 2009
(Answer Key)

www.jmap.org

Dear Sir

I have to acknolege the reciept of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensible as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

[4] Mean=315,000, median=180,000, and the median is stated to be the best measure of central tendency, an appropriate justification is given, and appropriate work is shown.
[3] Appropriate work is shown, but one computational error is made, but an appropriate measure of central tendency is stated, and an appropriate justification is given.
or [3] Mean=315,000, median=180,000, and the median is stated to be the best measure of central tendency, but no further correct work is shown.
[2] Appropriate work is shown, but two computational errors are made, but an appropriate measure of central tendency is stated, and an appropriate justification is given.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] Appropriate work is shown to find mean=315,000 and median=180,000, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one computational error are made.
or [1] Appropriate work is shown to find mean=315,000 or median=180,000, but no further correct work is shown.
or [1] Mean=315,000 and median=180,000, but no further correct work is shown, and no justification is given.
[0] Mean=315,000 or median=180,000, but no further correct work is shown, and no justification is given.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[1] obviously incorrect procedure.

[2] {1, 2, 4, 5, 9, 10, 12} or {$x|x$ = 1, 2, 4, 5, 9, 10, 12}
[1] 1, 2, 4, 5, 9, 10, 12, but set notation is not used.
or [1] Set notation is used and at least five correct numbers (but not the entire set) are written.
[0] Set notation is used, but fewer than five correct numbers are written.
or [0] {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[2] obviously incorrect procedure.

[3] $\frac{38}{\pi}$ or an equivalent answer in terms of π, and 2, and appropriate work is shown, and an appropriate explanation is given.
[2] Appropriate work is shown, but one computational or rounding error is made, but an appropriate explanation is given.
or [2] Appropriate work is shown and an appropriate explanation is given, but the correct height of the can is expressed as a decimal.
or [2] $\frac{38}{\pi}$ and 2, and appropriate work is shown, but an appropriate explanation is not given.
[1] Appropriate work is shown, but two or more computational or rounding errors are made, but an appropriate explanation is given.
[1] Appropriate work is shown, but one conceptual error is made, but an appropriate explanation is given.
or [1] $\frac{38}{\pi}$ and 2, but no work is shown.
[0] $\frac{38}{\pi}$ or 2, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an
[3] obviously incorrect procedure.

[4] D

[2] $30\sqrt{2}$, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but the answer is not in simplest radical form.
or [1] $30\sqrt{2}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[5]

[6] B

[7] B

[8] D

[9] A

[10] C

[11] C

[12] D

[13] D

[14] A

[15] B

[16] A

[3] $\frac{4}{9}$, and a correct tree diagram or sample space is shown.
[2] A correct tree diagram or sample space is shown, but no probability or an incorrect probability is given.
or [2] An incorrect tree diagram or sample space is shown, but an appropriate probability is found.
[1] Appropriate work is shown, but one conceptual error is made.
or [1] $\frac{4}{9}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[17]

[18] C

[19] A

[20] D

[21] C

[22] C

[23] D

[2] 111.25 or $111\frac{1}{4}$, and appropriate work is shown.
[1] Appropriate work is shown, but the answer is rounded.
or [1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] 111.25, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[24]

[25] B

[26] A

[4] Both inequalities are graphed and shaded correctly, and at least one is labeled, and a point in the solution set is identified.
[3] Appropriate work is shown, but one graphing error is made, such as drawing a solid line for $x > 2$ or shading incorrectly, but an appropriate point in the solution set is identified.
or [3] Both inequalities are graphed and shaded correctly, and a point in the solution set is identified correctly, but the graphs are not labeled or are labeled incorrectly.
or [3] Both inequalities are graphed and shaded correctly, and at least one is labeled, but no point in the solution set is identified.
[2] Appropriate work is shown, but two or more graphing errors are made, but an appropriate point in the solution set is identified.
or [2] Appropriate work is shown, but one conceptual error is made, such as graphing the lines $x = 2$ and $y = 2x - 6$ and identifying the point of intersection.
or [2] One of the inequalities is graphed and shaded correctly, and at least one is labeled, but no further correct work is shown.
[1] Appropriate work is shown, but one conceptual error and one graphing error are made, but an appropriate point in the solution set is identified.
or [1] Both inequalities are graphed incorrectly, but an appropriate point in the solution set is identified.
or [1] The lines $x = 2$ and $y = 2x - 6$ are graphed correctly, and at least one is labeled, but no further correct work is shown.
or [1] A point in the solution set is identified and shown to be correct by checking in both inequalities, but no graphs are drawn.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[27]

[28] B

[29] B

[30] C

[31] A

[32] A

[33] C

[4] 6 and –2, and appropriate work is shown, such as an algebraic solution or trial and error with at least three trials and appropriate checks.
[3] Appropriate work is shown, but one computational or factoring error is made.
or [3] Appropriate work is shown, but only one solution is found.
[2] The correct quadratic equation is written in standard form.
or [2] Appropriate work is shown, but two or more computational or factoring errors are made.
or [2] Appropriate work is shown, but one conceptual error is made.
or [2] The trial-and-error method is used to find at least one solution, but only two trials and appropriate checks are shown.
or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.
or [2] An incorrect quadratic equation of equal difficulty is solved appropriately.
[1] $x^2 - 11x - 12 = -7x$, but no further correct work is shown.
or [1] 6 and -2, but no work or only one trial with an appropriate check is shown.
or [1] An incorrect equation of a lesser degree of difficulty is solved appropriately.
or [1] Appropriate work is shown, but one conceptual error and one computational or factoring error are made.
[0] 6 or -2, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[34]

[35] A

[36] D

[3] $60-42\sqrt{5}$, and appropriate work is shown.
[2] Appropriate work is shown, but one computational error is made.
or [2] Appropriate work is shown, but only one term is expressed in simplest radical form.
[1] Appropriate work is shown, but two or more computational errors are made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but the answer is expressed as a decimal.
or [1] The distributive property is correctly applied, yielding $6\sqrt{100}-21\sqrt{20}$, but no further correct work is shown.
or [1] $60-42\sqrt{5}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[37]

[38] A

[39] D

[40] C

[41] B

[4] A correct tree diagram or sample space is given, and 18 total meals, 12 meals without juice, and 6 meals with chicken nuggets.
[3] A correct tree diagram or sample space is given, but either 18, 12, or 6 is missing or is incorrect.
or [3] The fundamental counting principle is used to find 18 total meals, 12 meals without juice, and 6 meals with chicken nuggets, but no tree diagram or sample space is given.
or [3] An incorrect tree diagram or sample space is given, but an appropriate number of meals is found for all three categories.
[2] A correct tree diagram or sample space is given, but an appropriate number of meals is found for only one category.
or [2] An incorrect tree diagram or sample space is given, but an appropriate number of meals is found for only two categories.
[1] A correct tree diagram or sample space is given, but no number of meals is found correctly.
or [1] An incorrect tree diagram or sample space is given, but an appropriate number of meals is found for only one category.
or [1] 18 total meals, 12 meals without juice, and 6 meals with chicken nuggets, but no work is shown.
[0] 18 total meals or 12 meals without juice or 6 meals with chicken nuggets, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[42]

[43] B

[44] C

[45] C

[4] Appropriate graphs are drawn, and (1, 0) and (-4, -5) are stated.
[3] Appropriate work is shown, but one graphing error is made, but appropriate solutions are stated.
or [3] Both graphs are drawn correctly, but only one solution is stated.
[2] Appropriate work is shown, but two or more graphing errors are made, but appropriate solutions are stated.
or [2] Appropriate work is shown, but one conceptual error is made, such as graphing a line instead of a parabola, but appropriate solutions are stated.
or [2] Both graphs are drawn correctly, but no solutions are stated.
or [2] (1, 0) and (-4, -5) are found as the points of intersection, but a method other than graphic is used.
[1] Appropriate work is shown, but one conceptual error and one graphing error are made.
or [1] The system is solved algebraically for only the *x* values, *y* values, or the coordinates of one point.
or [1] One graph is drawn correctly, but no further correct work is shown.
or [1] (1, 0) and (-4, -5) are stated, but no work is shown.
[0] (1,0) or (-4, -5) is stated, but no work is shown.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[46]

[47] B

[2] $36-9\pi$ or $36-3^2\pi$, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] Appropriate work is shown, but the answer is not expressed in terms of π.
or [1] $36-9\pi$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[48]

[2] $0 \le t \le 40$ or an equivalent answer.
[1] Appropriate work is shown, but one conceptual error is made, such as $0 < t < 40$ or $-23 \le t \le 50$.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[49]

[50] D

[2] $\frac{3k^2m^6}{4}$ or an equivalent answer, and appropriate work is shown.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] $\frac{3k^2m^6}{4}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[51]

[52] D