

Preparing for the  
Integrated Algebra  
Regents Exam



# Additional Regents Resources:



- [www.regentsreview2.net](http://www.regentsreview2.net)
- [regentsreview2@ymail.com](mailto:regentsreview2@ymail.com)

**facebook**

**twitter**

**myspace  
.com**

## Bring to the Exam:

3 Pens (Blue or Black Ink only)

2 Pencils and Erasers (for the graphs)

Ruler

Calculator (especially if you're comfortable using a specific one)

**\*\*If you don't have a calculator, there should be one made available to you.**

Student ID



# Test Format

Part I: Multiple Choice	60 points
30 Questions - 2 points each	
Part II: Open-Ended Response	6 points
3 Questions - 2 points each	
Part III: Open-Ended Response	9 points
3 Questions - 3 points each	
Part IV: Open-Ended Response	12 points
3 Questions - 3 points each	
Total: 39 Questions	87 points



## Important Stuff You Should Know

3 Hours...That's how long you have to take the exam  
(Most schools require you stay at least 2)

Answer every single question!!

Do all your work in the test booklet.

You get a reference sheet with your exam.  
You should familiarize yourself with it before the exam

Your calculator memory will be cleared at the beginning of the exam.  
You need to change the MODE back to DEGREE.



## Test Taking Tips

Read the whole problem, then read it again!

Write **ALL OVER** the Multiple Choice Questions. Your work isn't graded, but putting your thoughts down on paper really helps.

When a question is about a geometric figure, **ALWAYS** sketch it. Write down information you know about the shape before deciding what to do with the problem.

Bring a small snack for during the test to get a sugar boost and get a good nights sleep!



## Tips Continued....

USE THE CALCULATOR! Check all your mental math (you have 3 hours).  
If there is a graph, type it into the calculator and look at the table.



Being careful about just solving for  $x$ , versus plugging  $x$  into an expression.

Eliminate ridiculous answers from multiple choices.

Use your calculator to eliminate/check answers.

Try substituting your own numbers in for variables

The Algebra Topics...as I see them...

1. Real Numbers

2. Polynomials

3. Linear Equations

4. Linear Inequalities



The Algebra Topics...continued

5. Graphing

6. Systems of Equations

7. Factoring and Algebraic Fractions

8. Non-Linear Equations



A Few More Topics...

9. Radicals and Right Triangles

10. *Geometry*

11. Set Theory and Probability

12. Statistics



# MULTIPLE CHOICE QUESTIONS



January 2010

27.) An example of an algebraic expression is

(1)  $\frac{2x+3}{7} = \frac{13}{x}$

(3)  $4x - 1 = 4$

(2)  $(2x+1)(x-7)$

(4)  $x = 2$



January 2010



20.) Which expression is equivalent to  $3^3 \cdot 3^4$ ?

(1)  $9^{12}$

(3)  $3^{12}$

(2)  $9^7$

(4)  $3^7$

January 2010



21.) Which point is on the line  $4y - 2x = 0$

- |                |                |
|----------------|----------------|
| (1) $(-2, -1)$ | (3) $(-1, -2)$ |
| (2) $(-2, 1)$  | (4) $(1, 2)$   |

January 2010



24.) The expression  $6\sqrt{50} + 6\sqrt{2}$  written in simplest radical form is

(1)  $6\sqrt{52}$

(3)  $17\sqrt{2}$

(2)  $12\sqrt{52}$

(4)  $36\sqrt{52}$

January 2010

**25** What is the sum of  $\frac{3x^2}{x-2}$  and  $\frac{x^2}{x-2}$ ?

(1)  $\frac{3x^4}{(x-2)^2}$

(3)  $\frac{4x^2}{(x-2)^2}$

(2)  $\frac{3x^4}{x-2}$

(4)  $\frac{4x^2}{x-2}$



January 2010



26.) Which equation represents a line parallel to the graph of  $2x - 4y = 16$ ?

(1)  $y = \frac{1}{2}x - 5$

(3)  $y = -2x + 6$

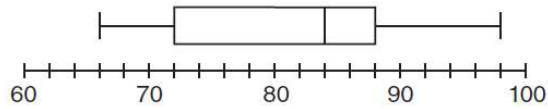
(2)  $y = -\frac{1}{2}x + 4$

(4)  $y = 2x + 8$

January 2010



1 The box-and-whisker plot below represents the math test scores of 20 students.



What percentage of the test scores are *less than* 72?

- (1) 25
- (2) 50
- (3) 75
- (4) 100

January 2010



**2** A bag contains eight green marbles, five white marbles, and two red marbles. What is the probability of drawing a red marble from the bag?

(1)  $\frac{1}{15}$

(3)  $\frac{2}{13}$

(2)  $\frac{2}{15}$

(4)  $\frac{13}{15}$

January 2010



3 Julia went to the movies and bought one jumbo popcorn and two chocolate chip cookies for \$5.00. Marvin went to the same movie and bought one jumbo popcorn and four chocolate chip cookies for \$6.00. How much does one chocolate chip cookie cost?

(1) \$0.50

(3) \$1.00

(2) \$0.75

(4) \$2.00

August 2009



**2** Which expression is equivalent to  $9x^2 - 16$ ?

(1)  $(3x + 4)(3x - 4)$

(3)  $(3x + 8)(3x - 8)$

(2)  $(3x - 4)(3x - 4)$

(4)  $(3x - 8)(3x - 8)$

August 2009



**3** Which expression represents  $(3x^2y^4)(4xy^2)$  in simplest form?

(1)  $12x^2y^8$

(3)  $12x^3y^8$

(2)  $12x^2y^6$

(4)  $12x^3y^6$

August 2009



**8** Which relationship can best be described as causal?

- (1) height and intelligence
- (2) shoe size and running speed
- (3) number of correct answers on a test and test score
- (4) number of students in a class and number of students with brown hair

August 2009



**12** Given:

$A = \{\text{All even integers from 2 to 20, inclusive}\}$

$B = \{10, 12, 14, 16, 18\}$

What is the complement of set  $B$  within the universe of set  $A$ ?

(1)  $\{4, 6, 8\}$

(3)  $\{4, 6, 8, 20\}$

(2)  $\{2, 4, 6, 8\}$

(4)  $\{2, 4, 6, 8, 20\}$

August 2009

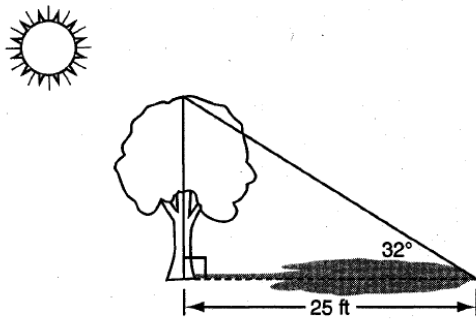


**13** Which value of  $x$  is in the solution set of the inequality  $-2(x - 5) < 4$ ?

- |       |       |
|-------|-------|
| (1) 0 | (3) 3 |
| (2) 2 | (4) 5 |

August 2009

14 A tree casts a 25-foot shadow on a sunny day, as shown in the diagram below.



If the angle of elevation from the tip of the shadow to the top of the tree is  $32^\circ$ , what is the height of the tree to the *nearest tenth of a foot*?

- (1) 13.2                      (3) 21.2  
(2) 15.6                      (4) 40.0



August 2009



**18** Which value of  $x$  makes the expression  $\frac{x^2 - 9}{x^2 + 7x + 10}$  undefined?

(1) -5

(3) 3

(2) 2

(4) -3

January 2010

6 In a science fiction novel, the main character found a mysterious rock that decreased in size each day. The table below shows the part of the rock that remained at noon on successive days.

Day	Fractional Part of the Rock Remaining
1	1
2	$\frac{1}{2}$
3	$\frac{1}{4}$
4	$\frac{1}{8}$

Which fractional part of the rock will remain at noon on day 7?

(1)  $\frac{1}{128}$

(3)  $\frac{1}{14}$

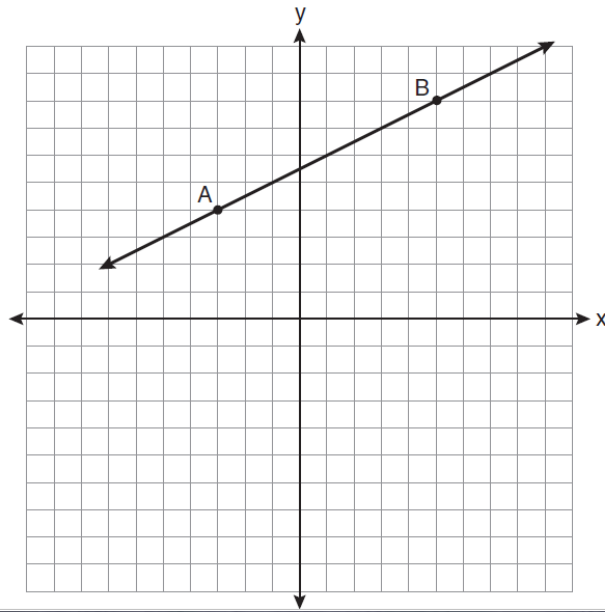
(2)  $\frac{1}{64}$

(4)  $\frac{1}{12}$



January 2010

7 In the diagram below, what is the slope of the line passing through points  $A$  and  $B$ ?



January 2010



11 Which expression represents  $\frac{12x^3 - 6x^2 + 2x}{2x}$  in simplest form?

(1)  $6x^2 - 3x$

(3)  $6x^2 - 3x + 1$

(2)  $10x^2 - 4x$

(4)  $10x^2 - 4x + 1$

January 2010

**10** The value of the expression  $-|a - b|$  when  $a = 7$  and  $b = -3$  is

(1)  $-10$

(3)  $-4$

(2)  $10$

(4)  $4$



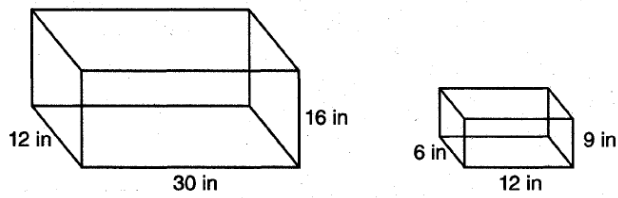


# OPEN ENDED QUESTIONS



August 2009 - Part II

32 The diagram below represents Joe's two fish tanks.



Joe's larger tank is completely filled with water. He takes water from it to completely fill the small tank. Determine how many cubic inches of water will remain in the larger tank.



August 2009 - Part II



33.) Clayton has three fair coins. Find the probability that he gets two tails and one head when he flips the three coins.

January 2010 - Part III



34.) Find the roots of the equation  $x^2 - x = 6$  algebraically.

August 2009 - Part III



34.) Find algebraically the equation of the axis of symmetry and the coordinates of the vertex of the parabola whose equation is  $y = -2x^2 - 8x + 3$ .

January 2010 - Part III

35 Ms. Mosher recorded the math test scores of six students in the table below.

Student	Student Score
Andrew	72
John	80
George	85
Amber	93
Betty	78
Roberto	80

Determine the mean of the student scores, to the *nearest tenth*.

Determine the median of the student scores.

Describe the effect on the mean and the median if Ms. Mosher adds 5 bonus points to each of the six students' scores.



January 2010 - Part III



**36** Using his ruler, Howell measured the sides of a rectangular prism to be 5 cm by 8 cm by 4 cm. The actual measurements are 5.3 cm by 8.2 cm by 4.1 cm. Find Howell's relative error in calculating the volume of the prism, to the *nearest thousandth*.



- 35** At the end of week one, a stock had increased in value from \$5.75 a share to \$7.50 a share. Find the percent of increase at the end of week one to the *nearest tenth of a percent*.
- At the end of week two, the same stock had decreased in value from \$7.50 to \$5.75. Is the percent of decrease at the end of week two the same as the percent of increase at the end of week one? Justify your answer.



36 The chart below compares two runners.

Runner	Distance, in miles	Time, in hours
Greg	11	2
Dave	16	3

Based on the information in this chart, state which runner has the faster rate. Justify your answer.



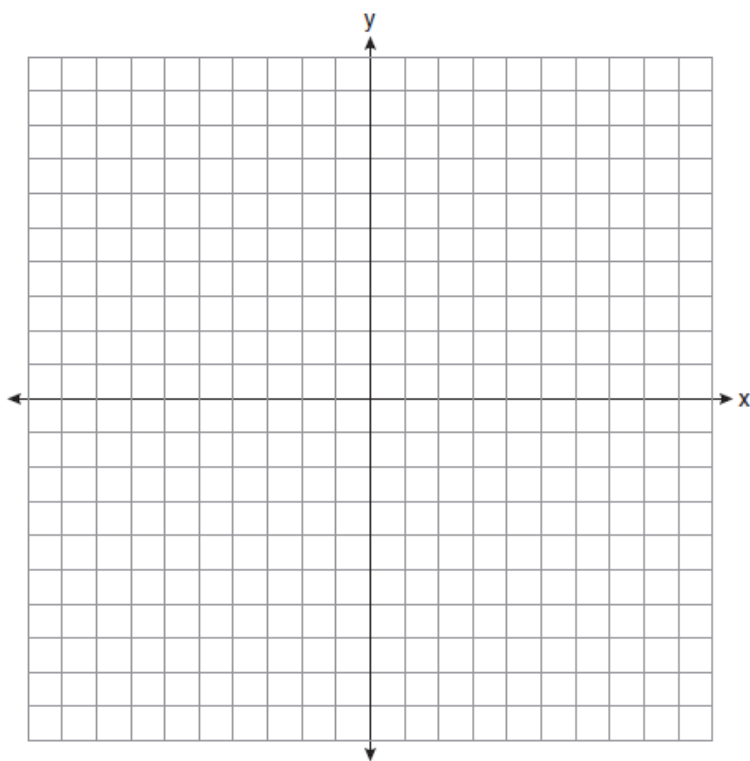
37 A password consists of three digits, 0 through 9, followed by three letters from an alphabet having 26 letters.

If repetition of digits is allowed, but repetition of letters is not allowed, determine the number of different passwords that can be made.

If repetition is not allowed for digits or letters, determine how many fewer different passwords can be made.

38 Graph the solution set for the inequality  $4x - 3y > 9$  on the set of axes below.

Determine if the point  $(1, -3)$  is in the solution set. Justify your answer.



January 2010 - Part IV



- 39.) Find three consecutive positive even integers such that the product of the second and third integers is twenty more than ten times the first integer. [Only an algebraic solution can receive full credit.]

August 2009 - Part IV

37 Express in simplest form:  $\frac{2x^2 - 8x - 42}{6x^2} \div \frac{x^2 - 9}{x^2 - 3x}$

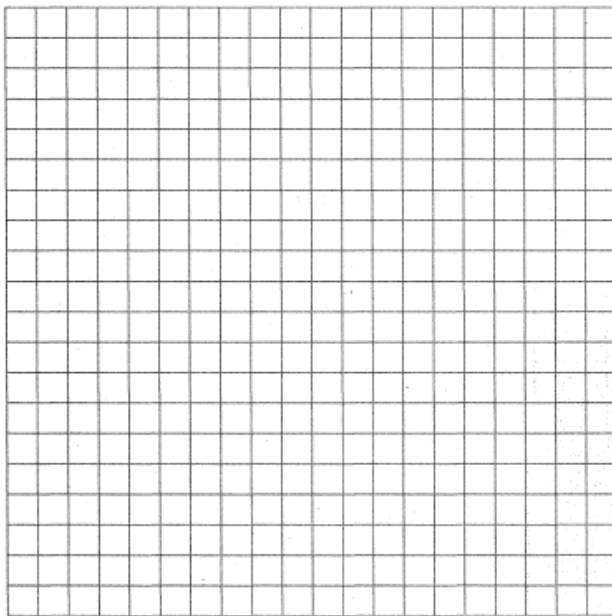


August 2009 - Part IV

38 On the grid below, solve the system of equations graphically for  $x$  and  $y$ .

$$4x - 2y = 10$$

$$y = -2x - 1$$



39 On the set of axes below, solve the following system of equations graphically for all values of  $x$  and  $y$ .

$$y = x^2 - 6x + 1$$

$$y + 2x = 6$$

