Name: _____ Honors Algebra Grade Boost Packet

This grade boost packet is due January 5th 2010. The packet must be fully completed to be graded.

Good Luck and Happy Holidays!

1 It takes Tammy 45 minutes to ride her bike 5 miles. At this rate, how long will it take her to ride 8 miles?

1) 0.89 hour
2) 1.125 hours
3) 48 minutes
4) 72 minutes

2 What are the roots of the equation $x^2 - 7x + 6 = 0$?

1) 1 and 7
2) -1 and 7
3) -1 and -6
4) 1 and 6

3 Which expression represents $\frac{27x^{18}y^5}{9x^6y}$ in simplest form?

1) $3x^{12}y^4$
2) $3x^3y^5$
3) $18x^{12}y^4$
4) $18x^3y^5$

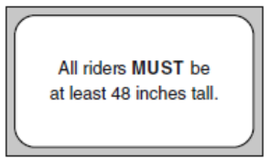
4 Marie currently has a collection of 58 stamps. If she buys *s* stamps each week for *w* weeks, which expression represents the total number of stamps she will have?

1) $58sw$
2) $58 + sw$
3) $58s + w$
4) $58 + s + w$

5 Which data set describes a situation that could be classified as qualitative?

1) the ages of the students in Ms. Marshall's Spanish class
2) the test scores of the students in Ms. Fitzgerald's class
3) the favorite ice cream flavor of each of Mr. Hayden's students
4) the heights of the players on the East High School basketball team

6 The sign shown below is posted in front of a roller coaster ride at the Wadsworth County Fairgrounds.



If *h* represents the height of a rider in inches, what is a correct translation of the statement on this sign?

1) $h < 48$
2) $h > 48$
3) $h \leq 48$
4) $h \geq 48$

7 Which value of *x* is the solution of the equation $\frac{2x}{3} + \frac{x}{6} = 5$?

1) 6
2) 10
3) 15
4) 30

8 Students in Ms. Nazzeer's mathematics class tossed a six-sided number cube whose faces are numbered 1 to 6. The results are recorded in the table below.

Result	Frequency
1	3
2	6
3	4
4	6
5	4
6	7

Based on these data, what is the empirical probability of tossing a 4?

1) 8/30 2) 5/30 3) 6/30 4) 1/30

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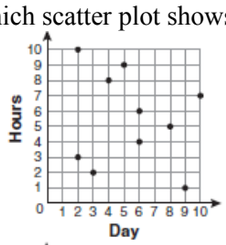
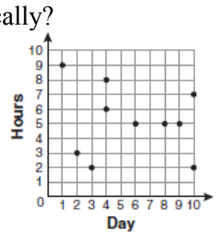
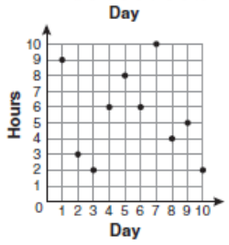
9 For 10 days, Romero kept a record of the number of hours he spent listening to music. The information is shown in the table below.

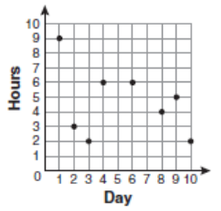
Day	1	2	3	4	5	6	7	8	9	10
Hours	9	3	2	6	8	6	10	4	5	2

Which scatter plot shows Romero's data graphically?

1) 

3) 

2) 

4) 

10 What is $\sqrt{32}$ expressed in simplest radical form?

1) $16\sqrt{2}$
2) $4\sqrt{2}$
3) $4\sqrt{8}$
4) $2\sqrt{8}$

11 If the speed of sound is 344 meters per second, what is the approximate speed of sound, in meters per hour?

60 seconds = 1 minute 60 minutes = 1 hour

1) 20,640
2) 41,280
3) 123,840
4) 1,238,400

12 The sum of two numbers is 47, and their difference is 15. What is the larger number?

1) 16
2) 31
3) 32
4) 36

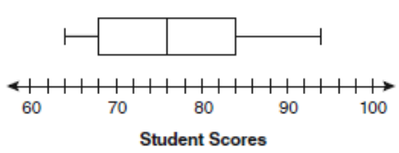
13 If $a+ar=b+r$, the value of a in terms of b and r can be expressed as

1) $\frac{b}{r}+1$
2) $\frac{1+b}{r}$
3) $\frac{b+r}{1+r}$
4) $\frac{1+b}{r+b}$

14 Which value of x is in the solution set of $\frac{4}{3}x+5<17$?

1) 8
2) 9
3) 12
4) 16

15 The box-and-whisker plot below represents students' scores on a recent English test.



What is the value of the upper quartile?

1) 68
2) 76
3) 84
4) 94

16 Which value of n makes the expression $\frac{5n}{2n-1}$ undefined?

1) 1
2) 0
3) $-\frac{1}{2}$
4) $\frac{1}{2}$

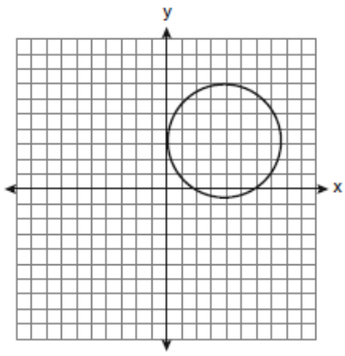
17 At Genesee High School, the sophomore class has 60 more students than the freshman class. The junior class has 50 fewer students than twice the students in the freshman class. The senior class is three times as large as the freshman class. If there are a total of 1,424 students at Genesee High School, how many students are in the freshman class?

1) 202
2) 205
3) 235
4) 236

18 What are the vertex and axis of symmetry of the parabola $y = x^2 - 16x + 63$?

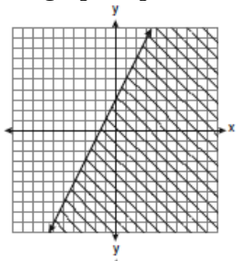
1) vertex: $(8, -1)$; axis of symmetry: $x = 8$
2) vertex: $(8, 1)$; axis of symmetry: $x = 8$
3) vertex: $(-8, -1)$; axis of symmetry: $x = -8$
4) vertex: $(-8, 1)$; axis of symmetry: $x = -8$

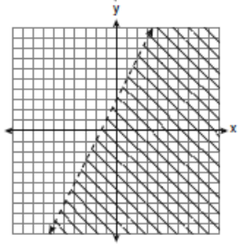
19 Which statement is true about the relation shown on the graph below?

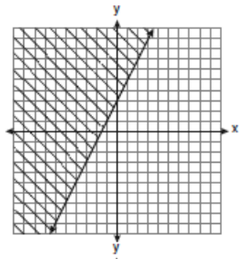


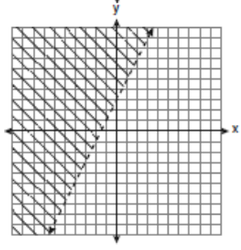
1) It is a function because there exists one x-coordinate for each y-coordinate.
2) It is a function because there exists one y-coordinate for each x-coordinate.
3) It is *not* a function because there are multiple y-values for a given x-value.
4) It is *not* a function because there are multiple x-values for a given y-value.

20 Which graph represents the solution of $3y - 9 \leq 6x$?

1)


2)


3)


4)


21 Which expression represents $\frac{x^2 - 2x - 15}{x^2 + 3x}$ in simplest form?

1) -5
2) $\frac{x-5}{x}$
3) $\frac{-2x-5}{x}$
4) $\frac{-2x-15}{3x}$

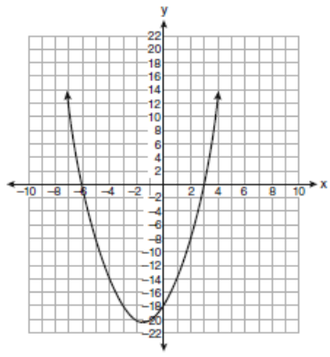
22 What is an equation of the line that passes through the point $(4, -6)$ and has a slope of -3?

1) $y = -3x + 6$
2) $y = -3x - 6$
3) $y = -3x + 10$
4) $y = -3x + 14$

23 When $4x^2+7x-5$ is subtracted from $9x^2-2x+3$, the result is

1) $5x^2+5x-2$
2) $5x^2-9x+8$
3) $-5x^2+5x-2$
4) $-5x^2+9x-8$

24 The equation $y=x^2+3x-18$ is graphed on the set of axes below.



Based on this graph, what are the roots of the equation $x^2+3x-18=0$?

1) -3 and 6
2) 0 and -18
3) 3 and -6
4) 3 and -18

25 What is the value of the *y*-coordinate of the solution to the system of equations $x+2y=9$ and $x-y=3$?

1) 6
2) 2
3) 3
4) 5

26 What is the additive inverse of the expression $a-b$?

1) $a+b$
2) $a-b$
3) $-a+b$
4) $-a-b$

27 What is the product of 12 and 4.2×10^6 expressed in scientific notation?

1) 50.4×10^6
2) 50.4×10^7
3) 5.04×10^6
4) 5.04×10^7

28 The expression x^2-16 is equivalent to

1) $(x+2)(x-8)$
2) $(x-2)(x+8)$
3) $(x+4)(x-4)$
4) $(x+8)(x-8)$

29 What is $\frac{6}{4a}-\frac{2}{3a}$ expressed in simplest form?

1) $\frac{4}{a}$
2) $\frac{5}{6a}$
3) $\frac{8}{7a}$
4) $\frac{10}{12a}$

30 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) $\{4,6,8\}$
2) $\{2,4,6,8\}$
3) $\{4,6,8,20\}$
4) $\{2,4,6,8,20\}$

31 Solve the following system of equations algebraically:

$$3x+2y=4$$

$$4x+3y=7$$

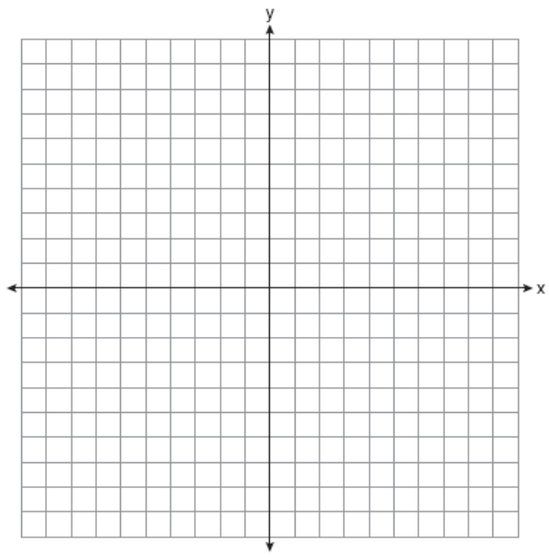
[Only an algebraic solution can receive full credit.]

32 Factor completely: $4x^3-36x$

33 On the set of axes below, graph the following system of inequalities and state the coordinates of a point in the solution set.

$$2x - y \geq 6$$

$$x > 2$$



34 Tom drove 290 miles from his college to home and used 23.2 gallons of gasoline. His sister, Ann, drove 225 miles from her college to home and used 15 gallons of gasoline. Whose vehicle had better gas mileage? Justify your answer

35 A bank is advertising that new customers can open a savings account with a $3\frac{3}{4}\%$ interest rate compounded annually. Robert invests $5,000 in an account at this rate. If he makes no additional deposits or withdrawals on his account, find the amount of money he will have, to the *nearest cent*, after three years.

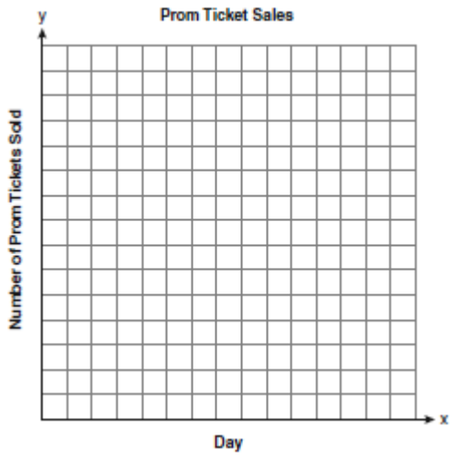
36 At the end of week one, a stock had increased in value from $5.75 a share to $7.50 a share. Find the percent of increase at the end of week one to the *nearest tenth of a percent*. At the end of week two, the same stock had decreased in value from $7.50 to $5.75. Is the percent of decrease at the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

37 The table below shows the number of prom tickets sold over a ten-day period.

Prom Ticket Sales

Day (x)	1	2	5	7	10
Number of Prom Tickets Sold (y)	30	35	55	60	70

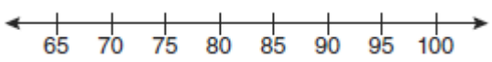
Plot these data points on the coordinate grid below. Use a consistent and appropriate scale. Draw a reasonable line of best fit and write its equation.



38 The test scores from Mrs. Gray's math class are shown below.

72, 73, 66, 71, 82, 85, 95, 85, 86, 89, 91, 92

Construct a box-and-whisker plot to display these data.



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

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

$$y + 2x = 6$$