

JANE: _____

January 2012 Regents

1 The yearbook staff has designed a survey to learn student opinions on how the yearbook could be improved for this year. If they want to distribute this survey to 100 students and obtain the most reliable data, they should survey

- (1) every third student sent to the office
- (2) every third student to enter the library
- (3) every third student to enter the gym for the basketball game
- (4) every third student arriving at school in the morning

2 What is the sum of the first 19 terms of the sequence 3, 10, 17, 24, 31, ...?

- (1) 1188
- (2) 1197
- (3) 1254
- (4) 1292

6 What is the product of $\left(\frac{x}{4} - \frac{1}{3}\right)$ and $\left(\frac{x}{4} + \frac{1}{3}\right)$?

- (1) $\frac{x^2}{8} - \frac{1}{9}$
- (2) $\frac{x^2}{16} - \frac{1}{9}$
- (3) $\frac{x^2}{8} - \frac{x}{6} - \frac{1}{9}$
- (4) $\frac{x^2}{16} - \frac{x}{6} - \frac{1}{9}$

9 What are the sum and product of the roots of the equation $6x^2 - 4x - 12 = 0$?

- (1) sum = $-\frac{2}{3}$; product = -2
- (2) sum = $\frac{2}{3}$; product = -2
- (3) sum = -2 ; product = $\frac{2}{3}$
- (4) sum = -2 ; product = $-\frac{2}{3}$

12 If the amount of time students work in any given week is normally distributed with a mean of 10 hours per week and a standard deviation of 2 hours, what is the probability a student works between 8 and 11 hours per week?

- (1) 34.1% (3) 53.2%
(2) 38.2% (4) 68.2%

13 What is the conjugate of $\frac{1}{2} + \frac{3}{2}i$?

- (1) $-\frac{1}{2} + \frac{3}{2}i$ (3) $\frac{3}{2} + \frac{1}{2}i$
(2) $\frac{1}{2} - \frac{3}{2}i$ (4) $-\frac{1}{2} - \frac{3}{2}i$

15 Which expression represents the third term in the expansion of

$(2x^4 - y)^3$?

- (1) $-y^3$ (3) $6x^4y^2$
(2) $-6x^4y^2$ (4) $2x^4y^2$

16 What is the solution set of the equation $3x^5 - 48x = 0$?

- (1) $\{0, \pm 2\}$ (3) $\{0, \pm 2, \pm 2i\}$
(2) $\{0, \pm 2, 3\}$ (4) $\{\pm 2, \pm 2i\}$

17 A sequence has the following terms: $a_1 = 4, a_2 = 10, a_3 = 25, a_4 = 62.5$.

Which formula represents the n th term in this sequence?

- (1) $a_n = 4 + 2.5n$ (3) $a_n = 4(2.5)^n$
(2) $a_n = 4 + 2.5(n - 1)$ (4) $a_n = 4(2.5)^{n-1}$

21 A spinner is divided into eight equal sections. Five sections are red and three are green. If the spinner is spun three times, what is the probability that it lands on red *exactly* twice?

(1) $\frac{25}{64}$

(3) $\frac{75}{512}$

(2) $\frac{45}{512}$

(4) $\frac{225}{512}$

28 Find the solution of the inequality $x^2 - 4x > 5$, algebraically.

29 Solve algebraically for x : $4 - \sqrt{2x - 5} = 1$

30 Evaluate: $\sum_{n=1}^3 (-n^4 - n)$

31 Express in simplest form: $\sqrt[3]{\frac{a^6 b^9}{-64}}$

32 A blood bank needs twenty people to help with a blood drive. Twenty-five people have volunteered. Find how many different groups of twenty can be formed from the twenty-five volunteers.