1. Given the parent function $p(x) = x^2$, what translations occur in the graph of $p(x) = (x - 7)^2 + 3$?
   A. right 7 units, up 3 units
   B. down 7 units, left 3 units
   C. left 7 units, up 3 units
   D. right 7 units, down 3 units

2. . Given the parent function $p(x) = \sqrt{x}$, what transformation occurs in the graph of $p(x) = \sqrt{x + 2} - 5$?
   A. right 2 units, up 5 units
   B. up 2 units, right 5 units
   C. left 2 units, down 5 units
   D. down 2 units, left 5 units

3. Write $3^{-2} = \frac{1}{9}$ in logarithmic form.
   A. $\log_3 (-2) = \frac{1}{9}$ B. $\log_3 \frac{1}{9} = -2$ C. $\log_{-2} \frac{1}{9} = 3$ D. $\log_{-2} 3 = \frac{1}{9}$

4. . In 2000, the deer population in a certain area was 800. The number of deer increases exponentially at a rate of 7% per year. Predict the population in 2009.
   A. 1408   B. 1434   C. 1502   D. 1492

5. . Find the balance in an account at the end of 8 years if $6000 is invested at an interest rate of 12% compounded continuously.
   A. $15,670.18   B. $15,490.38   C. $14,855.78   D. $14,560.22

6. Evaluate $\log_9 \frac{1}{81}$.
   A. $-\frac{1}{2}$ B. $\frac{1}{2}$ C. -2 D. 2

7. Solve $4^{x-2} = 3$ using common logarithms.
   A. 2.023   B. 2.247   C. 2.541   D. 2.792

8. A pharmaceutical company is creating a new cholesterol drug to prevent heart disease. The company must collect data by testing the drug before it is approved. Which would be the **best** method of data collection?

   A   experimental study

   B   observational study

   C   simulation

   D   survey

9. The table below shows the midterm and final exam grades of ten students.

Midterm	68	78	92	90	88	82	94	83	71	62
Final Exam	62	77	99	87	85	84	95	98	72	64

Which comparison between the midterm grades and the final exam grades is true?

A   The final exam grades have a higher mean and standard deviation than the midterm grades.

B   The final exam grades have a lower mean and standard deviation than the midterm grades.

C   The final exam grades have a higher mean and a lower standard deviation than the midterm grades.

D   The final exam grades have a lower mean and a higher standard deviation than the midterm grades.

The number of household members, x, living in Cityville homes has the following probability distribution:

10.

x	1	2	3	4	5	6	7	8
$P(x)$	0.21	0.28	0.16	0.22	0.06	0.04	0.02	0.01

What is the expected size of a household in Cityville?

A   2.43

B   2.89

C   3.17

D   4.50

11. A baseball team scored the following number of runs in its games this season: 6, 2, 5, 9, 11, 4, 5, 8, 6, 7, 5. There is one more game in the season. If the team wants to end the season with an average of at least 6 runs per game, what is the least number of runs the team must score in the final game of the season?

A   2

B   4

C   6

D   8

12. A survey was developed to estimate the average number of hours per week that adults spend exercising. Every third person entering a large fitness complex was surveyed, with a total of 2,500 people being surveyed. The data showed that the mean number of hours spent exercising was 3.2 hours per week. Which characteristic of the survey could create a bias in the results?

[1] the size of the sample   [3] the method of choosing the people who were surveyed
[2] the method of analyzing the data   [4] the size of the population

13. Jason and Eric discovered that the means of their grades for the first marking period in their math class were identical. They also noticed that the standard deviation of Jason's grades is 20.7, while the standard deviation of Eric's grades is 2.7. Which statement must be true?

[1] In general, Eric's grades were lower than Jason's grades.
[2] Eric's grades are more consistent than Jason's grades
[3] Eric had more failing grades during the marking period than Jason had.
[4] The median for Eric's grades is lower than the median for Jason's grades.

14. A bag contains 12 red Skittles, 12 blue Skittles, and 12 green Skittles candies. What is the probability of drawing two candies of the same color in a row, when the first candy drawn is looked at and eaten?

[1] 11/35   [2] 12/36   [3] 11/105   [4] 2/36

15. On a standardized test, Alisha received a score of 85, which was exactly 2 standard deviations above the mean. If the standard deviation for the test is 4, what is the mean for this test?   [1] 93   [2] 87   [3] 83   [4] 77

16. The average score for a Biology test is 77 and the standard deviation is 8. Which percent best represents the probability that any one student scored between 61 and 93 on the test?

[1] 99.5%   [2] 95%   [3] 68%   [4] 34%

17. A committee of five members is to be randomly selected from a group of nine freshman and seven sophomores. Which expression represents the number of different committees of three freshman and two sophomores that can be chosen?

[1] $_9P_3 \cdot {_7P_2}$ [2] $_9C_3 + {_7C_2}$ [3] $_{16}C_3 \cdot {_{16}C_2}$ [4] $_9C_3 \cdot {_7C_2}$

18. Your state issues license plates consisting of letters and numbers. There are 26 letters and the letters may be repeated. There are 10 digits and the digits may be repeated. How many possible license plates can be issued with two letters followed by three numbers?

[1] 25,000   [2] 67,600   [3] 250,000   [4] 676,000

19. The science test grades are posted. The class did very well. All students taking the test scored over 75. Unfortunately, 4 students were absent for the test and the computer listed their scores as 0 until the test is taken. Assuming that no score repeated more times than the 0's, what measure of central tendency would most likely give the best representation of this data?

[1] mean   [2] mode   [3] median   [4] range

20.

Which equation is represented by this graph?

$y = x^2 + 4$ [2] $y = (x + 4)^2$

$y = |x| + 4$ [4] $y = |x + 4|$
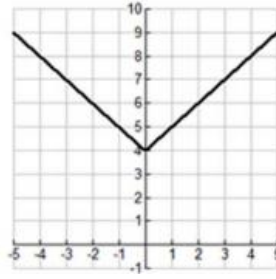
21.

Which interval notation represents the set of numbers that are greater than or equal to -1, but are less than 9?

[1] (-1,9]   [2] [-1,9]   [3] (-1,9)   [4] [-1,9)

22.

The graph of $y = 2^x$ lies in which Quadrants?

[1] I, II   [2] I, III   [3] I, IV   [4] II, III

23. What is the equation of the vertical asymptote of the function: $f(x) = \log_3(x + 7) - 9$

A. $x = 7$ B. $x = -7$ C. $x = 9$ D. $x = -9$

24. What is the equation of the horizontal asymptote of the function: $f(x) = 4^{x-5} - 11$

A. $y = 5$

B. $y = 11$

C. $y = -5$

D. $y = -11$

25. What is the range of this function, in interval notation: $f(x) = 7^{x+3} - 8$

A. $(-\infty, \infty)$

B. $(8, \infty)$

C. $(-8, \infty)$

D. $(-3, \infty)$