**Choose the letter of the correct answer. In all cases, E) NOTA means “none of these answers”.**

1) Given the polynomial

f(x) = Ax8 + Bx6 + Cx4 + Dx2 + 4 and

f(1) = 12. Find f(-1).

**A) -12 B) -1 C) 1**

**D) 12 E) NOTA**

2) What equation is closest to the graph shown below? (Note : each “tick mark”

represents one unit.)

**A) P(x) = (x + 3)(x – 1)**

**B) P(x) = (x + 3)(x – 1)2**

**C) P(x) = (x + 3)2(x – 1)**

**D) P(x) = (x + 3)2(x – 1)2**

**E) NOTA**

3) Find the product. (log253)(log9125)

1. ** B)  C) 3**

**D) 4 E) NOTA**

4) ****

****

** **

** E) NOTA**

5) Jessie is walking along line L that intersects the curve y = 2x2 – 8x + 12 at (0, y1) and (4, y2). Andrew is walking along line M which is perpendicular to line L. Find the slope of line M.

1. **0 B) 4 C) 12**

**D) undefined E) NOTA**

6) Daniel is at the focus of the parabola defined by y = 2x2 + 7x – 9. He wants to get some exercise, so he walks from the focus along a horizontal line until he reaches the parabola, turns around, and heads back to the focus. How far does Daniel walk once he returns to the focus?

1. ** B)  C) 1**

**D) 2 E) NOTA**

7) Which of the following statements is equivalent to ~(p ˄ q)?

**A) ~p ˄ ~q B) ~p ˅ ~q**

**C) ~p ˄ q D) ~p ˅ q**

**E) NOTA**

8) Evaluate 

1. ** B) 3 C) **

**D) 0 E) NOTA**

9) Find the units digit for

32145789341 + 749000023125675 + 5x , (x > 0).

1. **9 B) 7 C) 5**

**D) 1 E) NOTA**

10) Given square *A* *B*

ABCD, DE is twice

as long as EC, and

. Find the

area of square

ABCD.

*D E C*

1. **5 B) 15 C) 25**

**D) 225 E) NOTA**

11) The perimeter of a 30-60-90 right triangle is 30. Find the length of the hypotenuse.

**A) **

**B) **

**C) **

**D) 90**

**E) NOTA**

12) David has a new car. Well, actually, it is a used car. The odometer reads an integer mile between 0 and 999,999 (no tenths). How can David find the probability that there is at least one “1” among the digits?

1. **1 - .96 B)  C) .96**

**D)  E) NOTA**

13) Evaluate. 2012201120102 – 2(2012201120142) + 2012201120182

**A) 16 B) 24 C) 32**

**D) 40 E) NOTA**

14) Find the domain for .

**A) *R* B) **

**C)  D) **

**E) NOTA**

15) If , find A•B.

1. **-93 B) -15**

**C) -10 D) 93**

**E) NOTA**

16) If P(x) = 3x2 – 4x + k, which value below makes P(x) have no real zeroes?

1. ** B) 0 C) **

**D)  E) NOTA**

17) Shiming, Doreen, and Brian are studying independently for their driver’s license test. The probability Shiming will pass the test is , the probability Doreen will pass the test is , and the probability Brian will pass the test is . What is the probability at least one of these people passes the test?

**A)  B)  C) **

**D)  E) NOTA**

18) Solve over the Real Numbers.

x3 – 3x2 – 10x > 0

**A) **

**B) **

**C) **

**D) **

**E) NOTA**

19) Given , find f(2012).

1. **2011**

**B) 2012**

**C) 2013**

**D) 1638746984000**

**E) NOTA**

20) Find the maximum number of real zeroes for P(x) = x100 – x99 + x98 – x97 + … + x2 – x – 1. Note the signs alternate between terms until the constant term.

1. **101 B) 100 C) 99**

**D) 1 E) NOTA**

21) Find the coefficient of the sixth term of the expansion of (3x4 – y5)8.

1. **1512 B) 504**

**C) -504 D) -1512**

**E) NOTA**

22) Find the sum of the series 

1. **-4 B)  C) 12**

**D) 16 E) NOTA**

23) If , find

A + AB + B.

1. ** B) 6 C) 11**

**D)  E) NOTA**

24) David is walking in space and located at the point (6, 1, 3). Deleney is on the International Space Station where he is located at (4, -3, -2). How far apart are David and Deleney?

1. ** B) **

**C)**  **D) **

**E) NOTA**

25) If 27x • 4y = 1812, find x • y.

1. **108 B) 48 C) 14**

**D) 9 E) NOTA**

26) Given a regular dodecagon. Let

x = the sum of the measures of the internal angles of the dodecagon in degrees. Let y = the measure one external angle of the dodecagon in degrees. Find x + y.

1. **72 B) 1830**

**C) 2160** **D) 3630**

**E) NOTA**

27) Given a cubic function, M, such that when M(x) = 0, the solution set is

{0, 2, -3}. Find the solution set when M(x + 5) = 0.

1. **{-5}**

**B) {-3, -2, 1}**

**C) {-3, -2, 0}**

**D) {-8, -5, -3}**

**E) NOTA**

28) Let A = . Find the inverse of the cofactor of A32.

1. ** B) **

**C)  D) **

**E) NOTA**

29) Nick is climbing along the curve defined by f(x) = 3x3 – 4x2 + 5x – 3. If f(x) is placed on a coordinate system, Nick would be located in quadrant IV climbing towards the x-axis. Once he reaches the x-axis, he knows he will

never turn back down. Help Nick verify his claim by finding the least upper bound of this function.

1. **4 B) 3 C) 2**

**D) 0 E) NOTA**

30) Given g(x) = 3x4 – kx3 - 5x + 12. Find k so that -3 is a root of g(x).

1. **-10 B) -6 C)** 

**D)**  **E) NOTA**