**PART I**

**Total Value: 50%**

**Answer all items. Shade the letter of the correct answer on the computer scorable answer sheet.**

1. Given the graph below, which is true of the polynomial function?



|  |  |  |
| --- | --- | --- |
|  | Degree | Value of leading coefficient |
|  (A) | 3 | negative |
|  (B) | 3 | positive |
|  (C) | 5 | negative |
|  (D) | 5 | positive |

2. Given a polynomial function *P*(*x*) with , which is a factor of *P*(*x*)?

(A) 

(B) 

(C) 

(D) 

3. Which polynomial function best represents the graph shown below?



(A) 

(B) 

(C) 

(D) 

4. Whichpolynomial equation has a single root at  and a double root at ?

(A) 

(B) 

(C) 

(D) 

5. What are the *x*-intercepts of the graph of the function ?

(A) 

(B) 

(C) 

(D) 

6. When the function  is divided by , what is the remainder?

(A) 

(B) 

(C) 24

(D) 56

7.Which is true of the function ?

|  |  |  |
| --- | --- | --- |
|  | Horizontal stretch | Vertical stretch |
|  (A) |  |  |
|  (B) |  |  |
|  (C) |  |  |
|  (D) |  |  |

8. Which graph has an inverse that is also a function?

(A)

(B)

(C)

(D)

9. The point  is on the graph of . What is its image point under the transformation  of the graph of ?

(A) 

(B) 

(C) 

(D) 

10. What is the inverse of ?

(A) 

(B) 

(C) 

(D) 

11. What are the zeros of the function  after the transformation ?



(A) 

(B) 

(C) 

(D) 

12. What is the horizontal stretch of  as compared to ?

*y***=***f*(*x*) *y=af*(*bx*)

(A) 

(B) 

(C) 

(D) 

13. Which function best represents the graph shown below?



(A) 

(B) 

(C) 

(D) 

14. What are all of the invariant points for the graphs of  and ?

(A) 

(B) 

(C) 

(D) 

15. The graph of the function  is stretched horizontally by a factor of 2 and translated 3 units left. What is the domain of the transformed function?

(A) 

(B) 

(C) 

(D) 

16. Which graph represents an angle measuring ?

(A)

(B)

(C)

(D)

17. In which quadrant is  and ?

(A) I

(B) II

(C) III

(D) IV

18. What is 440 written in radian measure?

(A) 

(B) 

(C) 

(D) 

19. What is the length of the arc cut by a 240 sector in a circle having diameter 10 cm?



(A) 

(B) 

(C) 

(D) 

20. Given  are the coordinates on the terminal arm of an angle θ in standard position, what is ?

(A) 

(B) 

(C) 

(D) 

21. Solve for *x*: , where .

(A) 

(B) 

(C) 

(D) 

22. What is the domain of ?

 (A) 

(B) 

(C) 

(D) 

23. What is the period of ?

(A) 

(B) 

(C) 

(D) 

24. Which graph best represents the sinusoidal function ?

(A)

(B)

(C)

(D)

25. What is the range of the function ?

(A) 

(B) 

(C) 

(D) 

**PART II**

**Total Value: 50%**

Answer **ALL** items in the space provided. Show **ALL** workings.

*Value*

4 51.(a) Sketch the graph of the function  and clearly label the

 *x*-intercept(s) and the y-intercept.



2 51.(b) The dimensions of a rectangular prism are given by ,  and . Write an equation representing the volume in the form . Identify and justify all inadmissible values for *x*.

3 52.(a) The graph of  with points  is transformed

 so that . Plot the points and determine the equation of the image function in the form .

2 52.(b) Given the graph of the function  below, sketch the inverse graph of .

*Value*

2 53.(a) Solve graphically: 

2 53.(b) Use  to answer the questions below.

(i) Determine the invariant points for  and .

(ii) State the domain and range of .

*Value*

4 54. Algebraically determine the exact value of:

 (simplify completely)