|  |
| --- |
| **Mathematics 2200****Common Mathematics Assessment****Sample 2013** |
| Name: |  |
| Mathematics Teacher: |  |
|  |  |

27 Selected Response 27 marks

11 Constructed Response 40 marks

 **\_\_\_\_\_\_\_\_\_\_\_\_\_**

**FINAL 67 Marks**

**TIME: 2 HOURS**

**NOTE**

Diagrams are not necessarily drawn to scale.

**FORMULAE**

|  |  |  |
| --- | --- | --- |
|  |  |  |

|  |  |  |
| --- | --- | --- |
|  |  |  |

|  |  |  |
| --- | --- | --- |
|  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

**Selected Response:**

Choose the appropriate response on the answer sheet or SCANTRON.

|  |  |
| --- | --- |
| 1.  | How many terms are in the sequence  |
| (A)  | 43 |
| (B) | 45 |
| (C) | 46 |
| (D) | 48 |

|  |  |
| --- | --- |
| 2.  | In an arithmetic sequence, and . Which expression represents ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 3.  | Which describes the series ? |
| (A)  | convergent with a sum of  |
| (B) | convergent with no sum  |
| (C) | divergent with a sum of  |
| (D) | divergent with no sum |

|  |  |
| --- | --- |
| 4.  | What is the exact length of BC? |
| (A)  |  |
| (B) | 12 |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 5.  | The point lies on the terminal arm of an angle in standard position. What is the value of ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 6.  | Solve: , where  |
| (A)  |  and  |
| (B) |  and  |
| (C) |  and  |
| (D) |  and  |

|  |  |
| --- | --- |
| 7.  | What is the length of ***x***? |
| (A)  | 7.2 |
| (B) | 10.4 |
| (C) | 11.3 |
| (D) | 16.2 |

|  |  |
| --- | --- |
| 8.  | Which represents the function ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 9.  | Which represents a parabola with y-intercept and vertex ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |   |

|  |  |
| --- | --- |
| 10.  | If is written in the form , what is the value of ***q****?* |
| (A)  |  |
| (B) |  |
| (C) | 1 |
| (D) | 28 |

|  |  |
| --- | --- |
| 11.  | A rancher plans to use 430 m of fencing to build a cattle enclosure with three equal sections. Which represents the total area of the enclosure in terms of its width, x? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 12.  | Theresa’s incorrect solution to the equation is shown. In which step does the **first** error occur?*Step 1* *Step 2* *Step 3* *Step 4*  |
| (A)  | 1 |
| (B) | 2 |
| (C) | 3 |
| (D) | 4 |

|  |  |
| --- | --- |
| 13.  | Which describes the quadratic function that has vertex and passes through the point ? |
| (A)  | The axis of symmetry is and the discriminant is negative. |
| (B) | The axis of symmetry is and the discriminant is positive. |
| (C) | The axis of symmetry is and the discriminant is negative. |
| (D) | The axis of symmetry is and the discriminant is positive. |

|  |  |
| --- | --- |
| 14.  | Solve:  |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 15.  | Determine a simplified expression for the value of ***x***: |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |
| --- |
| 16. Write as an entire radical. |
|  | (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |
| --- |
| 17. Simplify completely:  |
|  | (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |
| --- |
| 18. Simplify completely:  |
|  | (A)  |  |
|  | (B) |  |
|  | (C) |  |
|  | (D) |  |

|  |
| --- |
| 19. Simplify completely:  |
|  | (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |
| --- |
| 20. Simplify completely:  |
|  | (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |
| --- |
| 21. Simplify completely:  |
|  | (A)  |  |
|  | (B) |  |
|  | (C) |  |
|  | (D) |  |

|  |  |
| --- | --- |
| 22.  | The graph shown represents the reciprocal of which quadratic function? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 23.  | What is the range of ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 24.  | Which is a solution to the system ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |
| --- |
| 25. The first four steps of an incorrect solution to the system  are shown. Identify the step in which the **first** error occurs.  *Step 1 :*  *Step 2:*  *Step 3:*  *Step 4:*  |
|  | (A)  | 1 |
|  | (B) | 2 |
|  | (C) | 3 |
|  | (D) | 4 |

|  |  |
| --- | --- |
| 26.  | Which represents the inequality ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

|  |  |
| --- | --- |
| 27.  | Which is a solution to ? |
| (A)  |  |
| (B) |  |
| (C) |  |
| (D) |  |

**Constructed Response:**

Answers to be written on this paper in the space provided. Show all workings.

|  |  |  |
| --- | --- | --- |
| 28. | The first three terms of an arithmetic sequence are . Algebraically determine the value of ***x*** and state the common difference. |  3 marks |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 29. | The monthly production of crude oil, in barrels, for the first four months for a test well at Hebron is given below. In theory, what is the expected lifetime production of the well, to the nearest barrel?

|  |  |
| --- | --- |
| Month | # of Barrels |
| 1 | 40 000 |
| 2 | 34 000 |
| 3 | 28 900 |
| 4 | 24 565 |

 |  3 marks |

|  |  |  |
| --- | --- | --- |
| 30. | Calculate the length of CD to the nearest tenth of a cm. |  4 marks |

|  |  |  |
| --- | --- | --- |
| 31. | From a height of 2 m, a volleyball is hit into the air. After 1 second, the ball reaches a maximum height of 7 m. Write the quadratic function, in the form  , that models the situation and use it to determine the height of the ball at 1.5 seconds.Function Height  |  3 marks |

|  |  |  |
| --- | --- | --- |
| 32.  | Algebraically determine the **exact** roots, in simplest form:  |  4 marks |

|  |  |
| --- | --- |
| 33. State restrictions on the variable and **solve**:  |  4 marks |

|  |  |
| --- | --- |
| 34. Identify all non-permissible values and **solve**:  |  4 marks |

|  |  |  |
| --- | --- | --- |
| 35.  | Algebraically determine the **invariant points**, **equations of asymptotes**, and **x- and y-intercepts** for the functions and . Sketch both graphs on the same set of axes.  |  4 marks |
|  |

|  |  |  |
| --- | --- | --- |
| 36. | Solve algebraically:  |  4 marks |

|  |  |  |
| --- | --- | --- |
| 37. | The right triangle shown has a perimeter of and an area of . Algebraically determine the value(s) of ***x*** and ***y***.  |  4 marks |

|  |  |  |
| --- | --- | --- |
| 38. | Algebraically determine the value(s) of ***x*** where lies above .  |  3 marks |

ANSWERS:

1.D 2.D 3.A 4.C 5.B 6.C 7.D 8.B 9.C 10.B 11.A 12.B 13.B 14.C 15.B 16.C 17.A18.B 19.D 20.A 21.A 22.C 23.D 24.C 25.C 26.D 27.A

28. x = 3, d = 9 29. 266 667 barrels 30. CD = 12.2cm

31. Function Height 5.75m 32.

33. restriction: , solution

34. non-permissible values: solution:

35. invariant points:

 equation of asymptotes:

 x-int: (-2,0) y-int: (0,4)

36.

37. Solution: (3,5)

38. solution in interval notation:

