MATHEMATICS

NAME: _____

2013 Mock WAEC • Sanniquellie Central High • Ms. RB Schulz

SCORE: _____ RANK: _____

Answer all questions on the answer sheet. Mark only one answer for each question. If you change an answer, clearly mark it with an X. No calculators. No cell phones. No sharing. Good luck!

1. Solve $x^2 - 6x + 9 = 0$
   A. $x = 0$
   B. $x = -3$
   C. $x = 3$
   D. $x = \pm 3$

2. Evaluate $\log_2 16$
   A. 8
   B. 3
   C. 6
   D. 4

3. Solve $\begin{cases} 2x + 5y = -6 \\ 2x - 5y = 14 \end{cases}$
   A. $x = 2$ and $y = -2$
   B. $x = -2$ and $y = 2$
   C. $x = 0$ and $y = 3$
   D. $x = 2$ and $y = 5$

4. y varies inversely as the square root of x. If $y = 5$ when $x = 16$, find y when $x = 100$.
   A. 20
   B. 10
   C. 100
   D. 2

5. Simplify $\left(\frac{6a}{ba}\right)\left(\frac{b}{3a^2}\right)$
   A. $\frac{2}{a^2}$
   B. $\frac{6ab}{3a^3b}$
   C. $6ab$
   D. $\frac{2}{a}$

6. Solve for x in $\sqrt{9x + 1} = 4$
   A. $\frac{3}{5}$
   B. $\frac{5}{3}$
   C. 3
   D. 7

7. Evaluate $\log_5 125$.
   A. 25
   B. 5
   C. 3
   D. It cannot be evaluated.

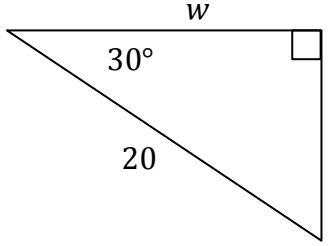
8. Change 412_5 to a base 10 number.
   A. 27
   B. 115
   C. 7
   D. 107

9. Simplify $\frac{(3x^2)^2}{6(x^{-1})}$
   A. $\frac{1}{2}$
   B. $6x^5$
   C. $\frac{3x^5}{2}$
   D. $\frac{x^3}{2}$

10. Solve $\log_{\sqrt{x}} 16 = 8$.
    A. 2
    B. $\frac{1}{2}$
    C. 4
    D. -2

11. Solve $2x^2 + 9x - 3 = x^2 - x - 27$.
    A. $x = -6$ and $x = -4$
    B. $x = 6$ and $x = 4$
    C. $x = 6$ and $x = -4$
    D. No real solution

12. Find the length of w.
    A. 13
    B. $10\sqrt{3}$
    C. 10
    D. 60



13. What is a seven-sided polygon called?
    A. hexagon
    B. octagon
    C. polygon
    D. heptagon

14. Calculate the distance between the points (2,7)and (4,6).
    A. 5
    B. 6
    C. $\sqrt{29}$
    D. $\sqrt{5}$

15. If $\sin\theta = \frac{1}{2}$ and $\cos\theta = \frac{\sqrt{3}}{2}$, what is $\tan\theta$?
    A. $\frac{1}{\sqrt{3}}$
    B. $\frac{\sqrt{3}}{3}$
    C. 1
    D. This problem is impossible.

16. Calculate $312_4 \times 32_4$.
    A. 9984_4
    B. 23310_4
    C. 343_4
    D. 29_4

17. Simplify $3\log 2 + \log 4 - \log 16$.
    A. $\log 8\frac{1}{4}$
    B. 2
    C. $\log\frac{6}{4}$
    D. $\log 2$

18. The number of female teachers in a school is 6 more than the number of male teachers. The total number of teachers is 28. How many female teachers are there in the school?
    A. 17
    B. 11
    C. 28
    D. 6

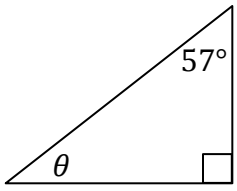
19. How many real solutions will the equation $x^2 + x + 5 = 0$ have?
    A. 2
    B. 1
    C. 0
    D. 3

20. Yei is 6 years younger than Saye. The product of their ages is 135. Find Saye's age.
    A. 9
    B. 15
    C. 24
    D. 17

21. Express $2\frac{3}{4}$ as an improper fraction.
    A. $\frac{11}{4}$
    B. $\frac{3}{2}$
    C. $\frac{7}{4}$
    D. $\frac{4}{11}$

22. Simplify $11^{\sqrt{5}} \cdot 11^{\sqrt{45}}$.
    A. $11^{\sqrt{50}}$
    B. 11^{15}
    C. $11^{4\sqrt{5}}$
    D. $11^{\sqrt{40}}$

23. Solve for θ.
    A. 180°
    B. 90°
    C. 33°
    D. 237°



The table below shows the scores of some math students on a recent test. Use it to answer questions 24, 25, and 26.

SCORE	*40*	*50*	*70*	*75*	*85*	*95*
FREQUENCY	*1*	*1*	*10*	*8*	*6*	*4*

24. What is the mode of the scores?
    A. 70
    B. 10
    C. 40
    D. 1

25. What is the median score?
    A. 10
    B. 70
    C. 75
    D. 95

26. What is the mean of the scores?
    A. 72.4
    B. 70
    C. 75.3
    D. 81

27. There are 8 red balls and 6 green balls in a bag. If one is chosen at random what is the probability it will be green?
    A. $\frac{4}{7}$
    B. $\frac{3}{7}$
    C. 6
    D. $\frac{9}{14}$

28. What is the mid-point of $(8, -2)$ and $(2, -4)$?
    A. $(10, -6)$
    B. $(4, -1)$
    C. $(3, -1)$
    D. $(5, -3)$

29. Evaluate $\log_9 \frac{1}{3} + 3\log_9 3$.
    A. 1
    B. 9
    C. 2
    D. -1

30. Correctly round 3.724 to the hundredths place.
    A. 3.724
    B. 3.72
    C. 3.7
    D. 3

31. How many equal sides does a scalene triangle have?
    A. 1
    B. 2
    C. 3
    D. None

32. The period T of a simple pendulum is found using the equation:
$$T = 2\pi\sqrt{\frac{\ell}{g}}$$
where ℓ is the length of the pendulum and g is the acceleration due to gravity. Solve for ℓ.
    A. $\ell = \frac{T^2 g}{4\pi^2}$
    B. $\ell = \frac{T^2 g}{2\pi}$
    C. $\ell = \frac{Tg}{4\pi^2}$
    D. $\ell = \frac{T\sqrt{g}}{2\pi}$

33. Solve for x and y in
$$\begin{bmatrix} 4 & 2 \\ -1 & 6 \end{bmatrix} - \begin{bmatrix} x & -1 \\ 0 & y \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ -1 & 4 \end{bmatrix}$$
    A. $(2, 2)$
    B. $(-2, -2)$
    C. $(0, 4)$
    D. $(4, 6)$

34. The circumference of a circle is 12π. Find the area in terms of π.
    A. 6π
    B. 8π
    C. 12π
    D. 36π

35. Factor $2x^2 + 5x + 2$.
    A. $(2x + 2)(x + 1)$
    B. $(2x + 1)(x + 2)$
    C. $(2x + 2)(2x + 1)$
    D. $(2x + 3)(x + 2)$

ESSAY PAPER 2

Answer all questions, show all work, and clearly mark final answers. Credit will be given for clarity of expression and orderly presentation of material.

1. If $126_w = 86$ find the value of w.

2. Simplify $\dfrac{\dfrac{ab^2}{bc^2}}{\dfrac{a^2}{bc^3}}$

3. For what values of x is the expression undefined?

$$\frac{x+1}{x^2+2x-8}$$

4. Solve for x in $7^x = \frac{49}{\sqrt[3]{7}}$