97807453
mathspercyyeung

mathspercyyeung.com

2020 – 2021
Form 5 Second Term Uniform Test

MATHEMATICS Compulsory Part

PAPER 2

24th May, 2021.
45 minutes

INSTRUCTIONS

1. Read carefully the instructions on the Answer Sheet. After the announcement of the start of the examination, you should insert the information required in the spaces provided.

2. When told to open this book, you should check that all the questions are there. Look for the words '**END OF PAPER**' after the last question.

3. All questions carry equal marks.

4. **ANSWER ALL QUESTIONS**. You should use an HB pencil to mark all your answers on the Answer Sheet, so that wrong marks can be completely erased with a clean rubber. You must mark the answers clearly; otherwise you will lose marks if the answers cannot be captured.

5. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.

6. No marks will be deducted for wrong answers.

There are 19 questions in Section A and 8 questions in Section B.

The diagrams in this paper are not necessarily drawn to scale.

Choose the best answer for each question.

Section A

1. If $3(2x+1) = -2(y-3)$, then $y =$

   A. $-3x + \dfrac{3}{2}$.

   B. $-2x + 1$.

   C. $2x - 1$.

   D. $3x - \dfrac{3}{2}$.

2. $\dfrac{a^{x-2} + a^{x-4}}{a^{x-4}} =$

   A. a^{x-1} .

   B. $a^{x-3}(1 + a^2)$.

   C. $1 + \dfrac{1}{a^2}$.

   D. $1 + a^2$.

3. $2h^2 - 2k^2 - h - k =$

   A. $(h-k)(2h+2k-1)$.

   B. $(h+k)(2h-2k-1)$.

   C. $2(h-k)(h+k-1)$.

   D. $2(h+k)(h-k-1)$.

4. If $x > 0 > y$, which of the following must be true?

   I. $x^2 > y^2$

   II. $\dfrac{1}{x} > \dfrac{1}{y}$

   III. $\left(\dfrac{1}{3}\right)^x > \left(\dfrac{1}{3}\right)^y$

   A. I only

   B. II only

   C. I and III only

   D. II and III only

5. The largest integer satisfying the compound inequality

   $$2(x+1)+5 \le 3 \quad \text{or} \quad \dfrac{4x-1}{11} < 1$$

   is

   A. -3.

   B. -2.

   C. 2.

   D. 3.

6. If z varies inversely as x and directly as the cube of y, which of the following must be constant?

   A. $x\,y^3 z$

   B. $x^3 y\,z^3$

   C. $\dfrac{y}{x^3 z^3}$

   D. $\dfrac{y^3}{xz}$

7. It is given that y partly varies directly as x and partly varies directly as the square of x. When $x = 1$, $y = 2$. When $x = 2$, $y = -2$. Find the value of y when $x = -1$.

   A. -2

   B. -3

   C. -5

   D. -8

8. Suppose that x varies directly as y and inversely as z^2. If y and z are both increased by 25%, then x

A. decreased by 20%.
B. decreased by 25%.
C. increased by 20%.
D. increased by 25%.

9. In the figure, $ADFB$ and $AEGC$ are straight lines. $DE \mathbin{/\mkern-5mu/} FG \mathbin{/\mkern-5mu/} BC$ and $DE:FG:BC=2:4:5$. Find the ratio of the area of $DFGE$ to that of $FBCG$.
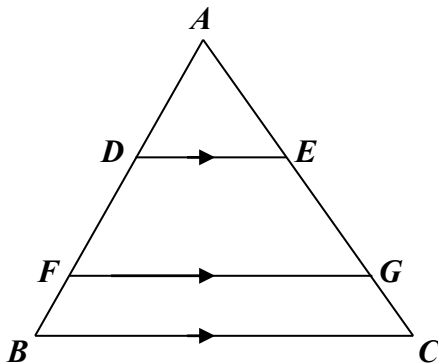
A. $4:3$
B. $4:9$
C. $16:9$
D. $16:25$

10. The figure shows a sphere fitting exactly inside a cylinder with the same radius. If the curved surface area of the cylinder is 36π cm², find the surface area of the sphere.
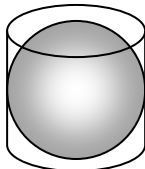
A. 9π cm²
B. 18π cm²
C. 36π cm²
D. 72π cm²

11. If $90° < a < b < 180°$, which of the following must be true?
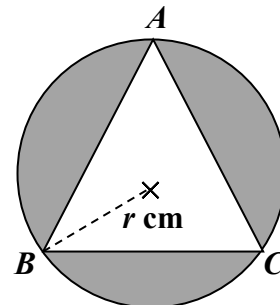
I. $\sin a < \sin b$
II. $\cos a > \cos b$
III. $\tan a > \tan b$

A. I only
B. II only
C. I and III only
D. II and III only

12. For $0° \leq x \leq 360°$, how many roots does the equation $\cos x(2\sin x - 1) = 0$ have?

A. 2
B. 3
C. 4
D. 5

13. In the figure, ABC is an equilateral triangle inscribed in a circle of radius r cm. Find the area of the shaded region.

A. $r^2\left(\pi - \dfrac{1}{4}\right)$ cm²

B. $r^2\left(\pi - \dfrac{\sqrt{3}}{4}\right)$ cm²

C. $r^2\left(\pi - \dfrac{3}{4}\right)$ cm²

D. $r^2\left(\pi - \dfrac{3\sqrt{3}}{4}\right)$ cm²

14. $\dfrac{\cos(90°-\theta)}{\sin(180°-\theta)}-\dfrac{\cos(360°-\theta)}{\tan(90°+\theta)}=$

    A. $1-\sin\theta$.

    B. $1+\sin\theta$.

    C. $\dfrac{1}{\tan\theta}-\sin\theta$.

    D. 0.

15. If two fair dice are thrown, find the probability that the sum of the two numbers obtained is a multiple of 3.

    A. $\dfrac{1}{3}$

    B. $\dfrac{1}{2}$

    C. $\dfrac{3}{4}$

    D. $\dfrac{7}{9}$

16. The pie chart below shows the expenditure of John in a certain week. John spends $ 240 on clothing that week. Find his expenditure on transportation that week.
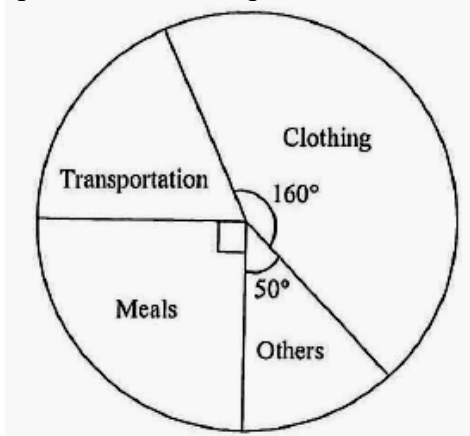
    A. $ 40

    B. $ 60

    C. $ 90

    D. $ 135

17. Consider the following data:

    1   3   5   7   7   10

    13   a b c

where $1\le a\le b\le c$. If the mean and the range of the above data are 7 and 20 respectively, which of the following is/are true?

    I. $c\le 20$

    II. $b=2$

    III. $a>1$

    A. II only

    B. III only

    C. I and II only

    D. I and III only

18. If the mode of the data set

    $\{m, n, 3, 6, 6, 2, 2, 1, 8, 4\}$

is 8, then the median of the data set is

    A. 5.

    B. 6.

    C. 7.

    D. 8.

19. The coordinates of the points A and B are $(-3, 2)$ and $(6, 1)$ respectively. If P is a moving point on the rectangular coordinate plane such that P maintain a fixed distance 3 units from the straight line L which passes through A and B, then the locus of P is

    A. the perpendicular bisector of AB.

    B. a pair of parallel lines at a distance 3 units from L.

    C. the circle with AB as a diameter.

    D. the angle bisector of $\angle AOB$, where O is the origin.

Section B

20. In the figure, *PS* and *QR* are parallel to the *x*-axis. If (x, y) is a point lying in the shaded region *PQRS* (including the boundary), at which point does $2x+3y+1$ attains its maximum value.
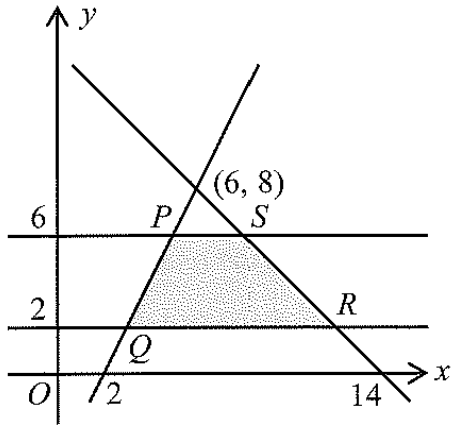
A. *P*
B. *Q*
C. *R*
D. *S*

21. If the circle $C: x^2 + y^2 - 4x + 8y + k = 0$ passes through (3, –2), then the area of the circle is

A. π sq. units.
B. 2π sq. units.
C. 4π sq. units.
D. 5π sq. units.

22. If the circle $x^2 + y^2 + Dx + 9y + 4 = 0$ touches the *x*-axis, then $D =$

A. ± 1.
B. ± 2.
C. ± 4.
D. ± 8.

23. Let k be a constant. If the circle $x^2 + y^2 - 2x - 6y + k = 0$ and the straight line $x - y + 4 = 0$ meet at exactly one point, find the radius of the circle.

A. $\sqrt{2}$
B. 4
C. $\sqrt{5}$
D. 8

24. Box *A* contains 5 blue pens and 3 black pens while Box *B* contains 2 blue pens and 3 black pens. If a box is randomly chosen and then a pen is randomly drawn from the box, find the probability that a blue pen is drawn.

A. $\dfrac{6}{13}$
B. $\dfrac{39}{80}$
C. $\dfrac{41}{80}$
D. $\dfrac{7}{13}$

25. If 4 boys and 7 girls are arranged in a row, how many ways of arrangement that all the boys are next to each other?

A. 120 960
B. 622 702
C. 854 226
D. 967 680

26. The standard score of Tom in a Mathematics examination is -2. If the score of Tom in the Mathematics examination is 33 marks and the mean of the scores of the Mathematics examination is 45 marks, then the standard deviation of the scores of the Mathematics examination is

A. 3 marks.
B. 6 marks.
C. 12 marks.
D. 36 marks.

27. A data set has a mean of a, and inter-quartile range of b and a standard deviation of c. If 5 is deduced from each number of the set and then all of them are multiplied by 2 to form a new data set, find the mean, the inter-quartile range and the standard deviation of the new data set.

	Mean	Inter-quartile range	s.d
A.	a	b	c
B.	$2a-10$	$2b-10$	$c-2$
C.	$2a-10$	$2b$	$2c$
D.	$2a$	$2b$	$2c$

End of Paper