GHS 2023-2024 Final F4 paper two

Date : 7 June 2024

Time : 10:45 – 11:30 (45 minutes)

Past Paper for
24-25 S4 FE Revision

INSTRUCTIONS

1. Read carefully the instructions on the Answer Sheet. After the announcement of the start of the examination, you should first write your name, class and class number on this cover page. You should also insert the information required in the spaces provided on the Answer Sheet. Darken the corresponding boxes accordingly if necessary. No extra time will be given for inserting the information or darkening the boxes after the "Time is up" announcement.

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

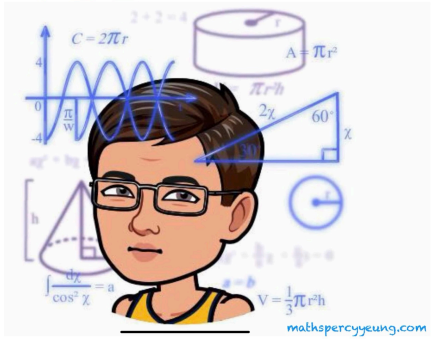
3. All questions carry equal marks.

4. **ANSWER ALL QUESTIONS**. You are advised to use an HB pencil to mark all the 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.

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



There are 18 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. $\dfrac{64^{2n+2}}{(32^{n+1})^2} =$

   A. 2.
   B. 2^{2n+2}.
   C. 2^{7n}.
   D. 2^{7n+7}.

2. If $2x+3y=8x+7y=-5$, find the value of y.

   A. -3
   B. $-\dfrac{5}{2}$
   C. 2
   D. $\dfrac{15}{4}$

3. The scale of a map is $1:500$. If the area of a stadium on the map is $60\ \text{cm}^2$, then the actual area of the stadium is

   A. $3000\ \text{m}^2$.
   B. $1500\ \text{m}^2$.
   C. $3\times10^4\ \text{m}^2$.
   D. $1.5\times10^7\ \text{m}^2$.

4. If m and n are constants such that $(3x-m)^3-225x-10\equiv 27x^3+5nx^2+115$, find the value of n.

   A. -77
   B. -5
   C. 5
   D. 27

5. If the straight lines $3x-2y+5=0$ and $kx+21y-9=0$ are perpendicular to each other, then $k=$

   A. 6.
   B. 12.
   C. 14.
   D. 21.

6. Let k be a constant. Solve $(x-k)(x+5k)=(2x-3k)(x+5k)$.

A. $x=2k$
B. $x=-5k$
C. $x=-2k$ or $x=5k$
D. $x=2k$ or $x=-5k$

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

A. $\frac{zy^2}{x^3}$
B. $\frac{zx^3}{y}$
C. $\sqrt{\frac{y}{zx}}$
D. $\frac{y^2}{zx^3}$

8. Let $f(x)=x^3+ax^2+b$, where a and b are constants. If $f(x)$ is divisible by $x+2$, find the remainder when $f(x)$ is divided by $x-2$.

A. 0
B. 4
C. 8
D. 16

9. Let $f(x)=x^{333}-x^{33}+1$. If k is a constant, which of the following must be true?

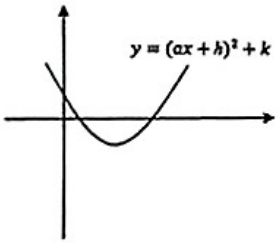
A. $f(k+1)=f(k)+f(1)$
B. $f(k-1)=f(k)-f(1)$
C. $f(3)+f(-3)=2$
D. $f(3)-f(-3)=0$

10. Which of the following statements about the graph of $y=(4-x)^2+6$ must be true?

A. The y-intercept of the graph is 6.
B. The x-intercept of the graph is 4.
C. The graph opens downwards.
D. The graph does not cut the x-axis.

11. The figure shows the graph of $y=(ax+h)^2+k$, where a, h and k are constants. Which of the following must be true?

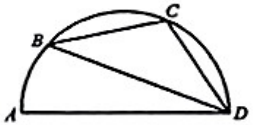
I. $a>0$
II. $k<0$
III. $ah>0$



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

12. The figure shows the semi-circle $ABCD$. If $BC=CD$ and $\angle BDC=38°$, then $\angle BDA=$

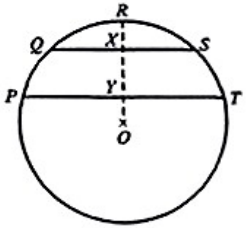
A. 14°.
B. 19°.
C. 26°.
D. 38°.



Circle Properties (Not included in 24-25 S4 FE)

13. In the figure, O is the centre of the circle $PQRST$. OR intersects QS and PT at X and Y respectively. If $OX \perp QS$, $OY \perp PT$ and $\overset{\frown}{RS}=\overset{\frown}{ST}$, which of the following must be true?

I. $QS=2QX$
II. $\angle POT=2\angle QOS$
III. $PT=2QS$



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

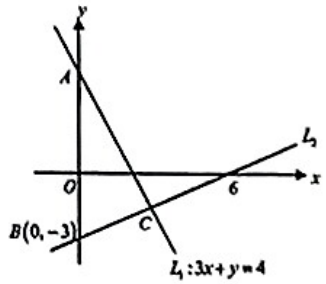
Circle Properties (Not included in 24-25 S4 FE)

14. It is given that X, Y and Z are solid spheres. If the volume of X : the volume of $Y=64:125$ and the surface area of X : the surface area of $Z=16:9$, then the radius of Y : the radius of $Z=$

A. 3 : 5.
B. 4 : 3.
C. 5 : 3.
D. 8 : 5.

15. In the figure, $L_1: 3x+y=4$ cuts the y-axis at A. L_2 is another straight line passing through $B(0,-3)$ and cuts the x-axis at $(6,0)$. Denote the point of intersection of L_1 and L_2 by C. Find the area of ΔABC.

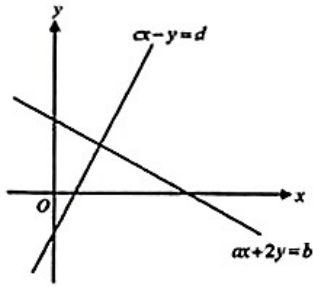
A. 6
B. 7
C. 12
D. 14



16. The figure shows the straight lines $ax+2y=b$ and $cx-y=d$. Which of the following must be true?

I. $c>0$
II. $b+2d>0$
III. $ad-bc>0$

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



17. Let $p(x)$ be a polynomial. When $p(x)$ is divided by $x-2$, the remainder is 5. If $p(x)$ is divisible by $x+3$, find the remainder when $p(x)$ is divided by x^2+x-6.

A. $x+3$
B. $x-3$
C. $-x+3$
D. $-x-3$

18. It is given that m varies inversely as p and directly as the square root of q. If m is increased by 20% and q is decreased by 20%, then p is

A. increased by 74.5%.
B. increased by 25.5%.
C. decreased by 25.5%.
D. decreased by 74.5%.

SECTION B

19. If $g \neq h$ and $g^2+5g=h^2+5h=8$, then $g^2+h^2=$

A. −9.
B. 9.
C. 41.
D. 64.

20. $\dfrac{i^{2023}+2i^{2024}}{3+i}=$

A. $\dfrac{1}{2}-\dfrac{1}{2}i$.
B. $-\dfrac{1}{2}+\dfrac{1}{2}i$.
C. $-\dfrac{7}{10}-\dfrac{1}{10}i$.
D. $\dfrac{7}{10}+\dfrac{1}{10}i$.

21. Which of the following is the greatest?

A. 456^{-123}
B. $(234)^{156}$
C. $\left(\dfrac{1}{246}\right)^{-351}$
D. $(-123)^{456}$

22. $\dfrac{2}{x^2-4}-\dfrac{1}{x^2-2x}=$

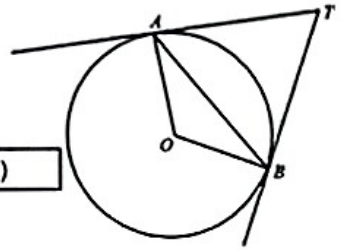
A. $\dfrac{1}{x(x-2)}$.
B. $\dfrac{1}{x(x+2)}$.
C. $\dfrac{1}{(x-2)(x+2)}$.
D. $\dfrac{1}{x(x-2)(x+2)}$.

23. The L.C.M. of $6m^2n^3$, $18m^3n$ and $24mn^5$ is

A. $6mn$.
B. $24m^3n^9$.
C. $72mn$.
D. $72m^3n^5$.

24. In the figure, O is the centre of the circle. TA and TB are tangents to the circle at A and B respectively. If $\angle ATB = 56°$, find $\angle OAB$.

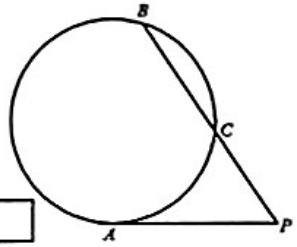
A. 17°
B. 22°
C. 28°
D. 34°



Circle Properties (Not included in 24-25 S4 FE)

25. In the figure, ABC is a circle. BC is produced to P such that AP is the tangent to the circle at A. If $AP = 12$ cm and $CP = 8$ cm, then $BC =$

A. 8 cm.
B. 10 cm.
C. 12 cm.
D. 16 cm.



Circle Properties (Not included in 24-25 S4 FE)

26. Let a, b and c be constants where $a > b > c > 1$. On the same rectangular coordinate system, the graph of $y = a^x$ and the graph of $y = b^x$ cut the straight line $y = c$ at the points P and Q respectively. If the coordinates of R are $(0, c)$, then $\frac{PR}{QR} =$

A. $\log_a b$.
B. $\log_c b$.
C. $\log_b a$.
D. $\log_c a$.

END OF PAPER