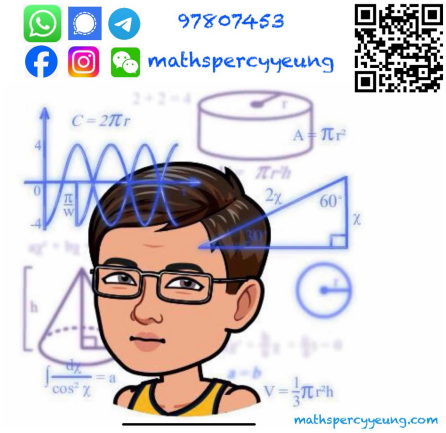
17-18 F.5
1st TERM UT
MATH CP
PAPER 2

MC



2017 – 2018
Form 5 First Term Uniform Test

MATHEMATICS Compulsory Part

PAPER 2

31st October, 2017.
9:45 am – 10:30 am (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 11 questions in Section A and 16 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. Simplify $\frac{x^2y^2}{x^3y}$.

A. xy

B. $\frac{y}{x}$

C. $\frac{x}{y}$

D. $\frac{1}{xy}$

2. If $\frac{1}{p}-\frac{1}{q}=\frac{2}{r}$, then $q =$

A. $p-\frac{r}{2}$.

B. $\frac{r-2p}{pr}$.

C. $\frac{pr}{r-2p}$.

D. $\frac{pr}{r+2p}$.

3. $m^2+2m+1-4n^2 =$

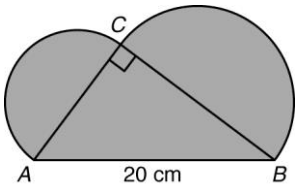
A. $(m-2n+1)(m+2n+1)$

B. $(m-2n+1)(m+2n-1)$

C. $(m+2n+1)(m+2n+1)$

D. $(m+2n+1)(m+2n-1)$

4. In the figure, the ratio of the diameters of the larger semi-circle to that of the smaller semi-circle is 4 : 3. Find the area of the figure.



A. $100\pi\,\text{cm}^2$

B. $200\pi\,\text{cm}^2$

C. $(28\pi+96)\,\text{cm}^2$

D. $(50\pi+96)\,\text{cm}^2$

5. If θ lies in quadrant II, which of the following must be true?

I. $\tan(90°-\theta)<0$

II. $\sin(180°+\theta)<0$

III. $\cos(270°-\theta)<0$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

6. If $\tan\theta=\frac{3}{4}$ and $180°<\theta<270°$, $\cos\theta =$

A. $\frac{4}{5}$.

B. $\frac{3}{5}$.

C. $-\frac{3}{5}$.

D. $-\frac{4}{5}$.

7. $\sin(180°-\theta)\cos(360°+\theta)\tan(90°-\theta)=$

A. $\sin\theta\tan\theta$.

B. $\cos\theta\tan\theta$.

C. $\sin^2\theta$.

D. $\cos^2\theta$.

8. If $a<0$, then the minimum value of $y=\dfrac{\sin ax}{a}$ is

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

B. $-\dfrac{1}{a}$.

C. -1.

D. 0.

9. Solve the compound inequality $2(x+5)\geq -6$ and $4(x+6)>x-6$.

A. $x\geq -8$

B. $x>-10$

C. $-10<x\leq -8$

D. no solutions

10. Which of the following compound inequalities has 'all real numbers' as its solutions?

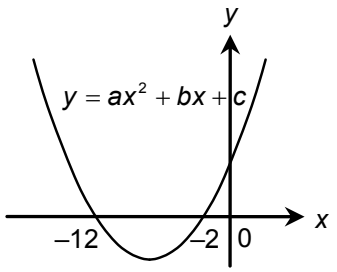
A. $x>2$ or $x<0$

B. $x>0$ or $x<2$

C. $x>2$ and $x<0$

D. $x<2$ and $x<0$

11. The figure shows the graph of $y=ax^2+bx+c$. The solutions of $ax^2+bx+c\geq 0$ are



A. $-12\leq x\leq -2$.

B. $-12<x<-2$.

C. $x\leq -12$ or $x\geq -2$.

D. $x<-12$ or $x>-2$.

Section B

12. The solutions of $x^2+7x+10>0$ are

A. $x>-5$.

B. $x>-2$.

C. $-5<x<-2$.

D. $x<-5$ or $x>-2$.

13. $(4a^{\frac{3}{2}})^{\frac{-1}{2}}=$

A. $4a$

B. $2a^{\frac{3}{4}}$

C. $\dfrac{2}{a^{\frac{3}{4}}}$

D. $\dfrac{1}{2a^{\frac{3}{4}}}$

14. $\sqrt[3]{\dfrac{2a^{10}}{128a}} =$

A. $\dfrac{a^2}{8}$.

B. $\dfrac{a^3}{8}$.

C. $\dfrac{a^2}{4}$.

D. $\dfrac{a^3}{4}$.

15. Which of the following graphs has reflectional symmetry with the graph of $y = 5^{-x}$ about the y-axis?

A. graph of $y = -\dfrac{1}{5^x}$

B. graph of $y = 5^x$

C. graph of $y = -5^x$

D. graph of $y = \dfrac{1}{5^x}$

16. $\log 20 + \log 50 - \log 10 =$

A. 2.

B. $\log 60$.

C. $\log 20 + \log 40$.

D. $\dfrac{\log 70}{\log 10}$.

17. If $\log_x 8 = y$, then

A. $x^y = 8$

B. $y^x = 8$

C. $y = 8^x$

D. $y = x^8$

18. Given that $\log 2 = x$ and $\log 3 = y$, express $\log\left(\dfrac{45}{4}\right)$ in terms of x and y.

A. $3x - 2y + 1$

B. $3x - 2y - 1$

C. $2y - 3x + 1$

D. $2y - 3x - 1$

19. Suppose a and b are non-zero real numbers. Which of the following must be real?

I. $ai \times bi$

II. $(a - bi)^2$

III. $(a - bi)(a + bi)$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

20. Simplify and express $\sqrt{-81} + \sqrt{-36}$ in the form $a + bi$.

A. $3i$

B. $15i$

C. $9 + 6i$

D. $9 - 6i$

21. Find the values of the real numbers x and y if $(4 - x) + 3yi = (3x - 1) - (2y - 3)i$.

A. $x = \dfrac{5}{4}$ and $y = \dfrac{3}{5}$

B. $x = \dfrac{4}{5}$ and $y = -\dfrac{3}{5}$

C. $x = -\dfrac{4}{5}$ and $y = \dfrac{5}{3}$

D. $x = -\dfrac{5}{4}$ and $y = -\dfrac{3}{5}$

22. Solve $\frac{1}{x-1}-\frac{1}{x}=\frac{1}{6}$.

A. $x=2$

B. $x=3$

C. $x=-2$ or 3

D. $x=-3$ or 2

23. Solve $5\sin x-3\cos x=0$ for $180°\le x\le 360°$. (Give your answer correct to the nearest degree.)

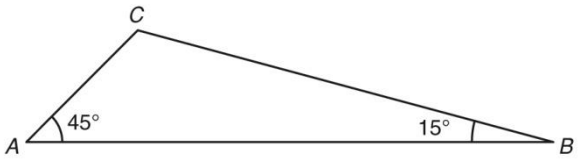
A. 193°

B. 211°

C. 217°

D. 233°

24. In the figure, $\frac{BC}{AB}=$



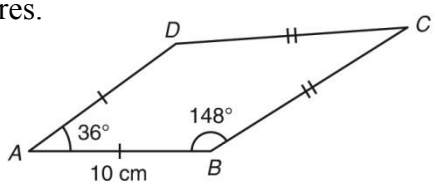
A. $\frac{1}{\sqrt{2}}$.

B. $\frac{\sqrt{6}}{2}$.

C. $\frac{\sqrt{6}}{3}$.

D. $\frac{\sqrt{6}}{4}$.

25. In the figure, $AD = AB$ and $CD = CB$. Find the area of $ABCD$, correct to 4 significant figures.



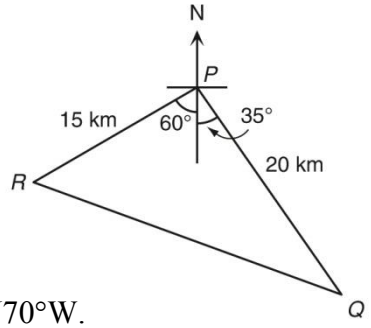
A. 40.45 cm^2

B. 58.78 cm^2

C. 67.69 cm^2

D. 80.90 cm^2

26. In the figure, the compass bearing of R from Q is, correct to the nearest integer.



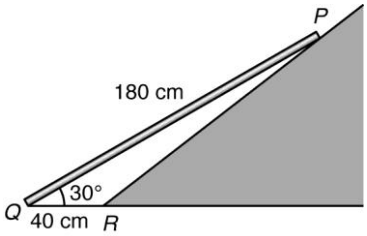
A. N70°W.

B. N65°W.

C. N35°W.

D. S35°E.

27. In the figure, a ladder PQ of 180 cm leans against an inclined slope PR and makes an angle of 30° with the horizontal. If QR = 40 cm, find the distance between P and R, correct to 3 significant figures.



A. 133 cm

B. 138 cm

C. 147 cm

D. 155 cm

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