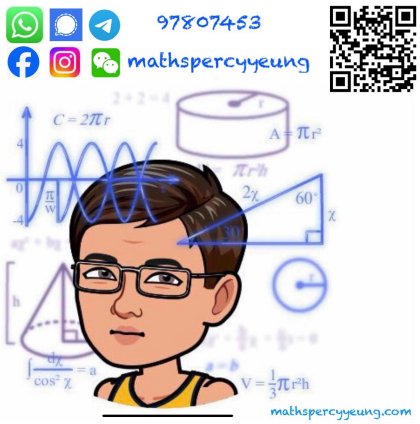
17-18 F.4
2nd TERM EXAM
MATH CP
PAPER 2
MC



2017 – 2018
Form 4 Second Term Examination

MATHEMATICS Compulsory Part

PAPER 2

5th June, 2018
10:15 am – 11:15 am (1 hour)

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 24 questions in Section A and 12 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. $(-2)^{2017}\left(\frac{1}{4}\right)^{2016} =$

   A. $-\frac{1}{2^{2015}}$.
   B. $\frac{1}{2^{2015}}$.
   C. -2^{2015} .
   D. 2^{2015} .

2. 0.003459749 =

   A. 0.003 (correct to 3 significant figures).
   B. 0.00346 (correct to 4 significant figures).
   C. 0.003460 (correct to 6 decimal places).
   D. 0.0034598 (correct to 7 decimal places).

3. $hp-kp+hm-km-hn+kn=$

   A. $(h+k)(p-m+n)$.
   B. $(h+k)(p+m-n)$.
   C. $(h-k)(p-m+n)$.
   D. $(h-k)(p+m-n)$.

4. Which of the following statements may be false?

   A. All non-negative integers are natural numbers.
   B. All fractions are real numbers.
   C. All integers are rational numbers.
   D. All recurring decimals are rational numbers.

5. Simplify $\sqrt{18}-\sqrt{50}$.

   A. $-16\sqrt{2}$
   B. $-2\sqrt{2}$
   C. $\sqrt{2}$
   D. $2\sqrt{2}$

6. If k is a constant such that x^3-kx^2+8x-4 is divisible by $x+2$, then $k=$

   A. –7.
   B. –5.
   C. 5.
   D. 7.

7. If h and k are constants such that $hx+(x-3)^2 \equiv x^2+10x+k$, then

   A. $h=10$ and $k=-9$.
   B. $h=10$ and $k=9$.
   C. $h=16$ and $k=-9$.
   D. $h=16$ and $k=9$.

8. $y=\frac{1}{x^2-36}$ is a function of x. Which of the following is the largest domain of the function?

   A. All non-negative real numbers.
   B. All real numbers except 6 and –6.
   C. All positive real numbers.
   D. All positive numbers greater than or equal to 6.

9. Let $f(x)=(x+3)(2x-5)$. If $f(k)=2k$, then $k=$

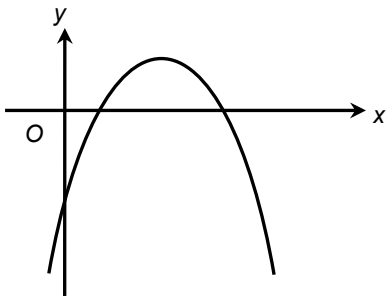
A. -3.

B. $-\frac{5}{2}$ or 3.

C. -3 or $\frac{5}{2}$.

D. $\pm\sqrt{\frac{15}{8}}$.

10. The figure shows the graph of $y=a(x+b)^2+1$, where a and b are constants. Which of the following is true?



A. $a>0$ and $b>0$

B. $a>0$ and $b<0$

C. $a<0$ and $b>0$

D. $a<0$ and $b<0$

11. Let x be the larger one of two consecutive odd numbers. If the sum of the squares of the two odd numbers is less than four times the product of the two odd numbers by 2, then

A. $x^2+(x-1)^2=4x(x-1)+2$.

B. $x^2+(x-1)^2=4x(x-1)-2$.

C. $x^2+(x-2)^2=4x(x-2)+2$.

D. $x^2+(x-2)^2=4x(x-2)-2$.

12. Solve $(2y-1)^2-4=6y-1$.

A. $y=\frac{5\pm\sqrt{33}}{4}$

B. $y=\frac{-5\pm\sqrt{33}}{4}$

C. $y=\frac{3\pm\sqrt{17}}{4}$

D. $y=\frac{-3\pm\sqrt{17}}{4}$

13. If the graph of $y=5x^2-10x+6-k$ does not intersect the x-axis, find the range of the values of k.

A. $k>-1$

B. $k\geq-1$

C. $k<1$

D. $k\leq1$

14. If $k<0$, then the quadratic equation has $x^2-x+6k=0$

A. a double real root.

B. no real roots.

C. two negative roots.

D. a positive root and a negative root.

15. Let k be a constant. Solve the equation $(x-k)^2=4k^2$.

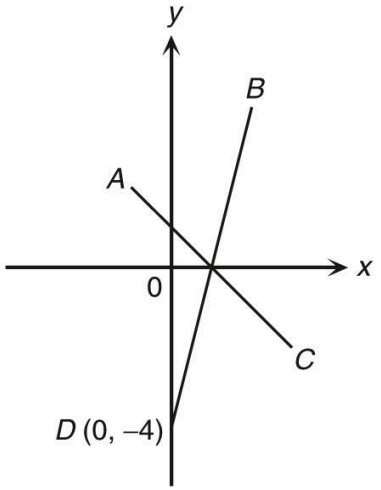
A. $x=3k$

B. $x=5k$

C. $x=-k$ or $x=3k$

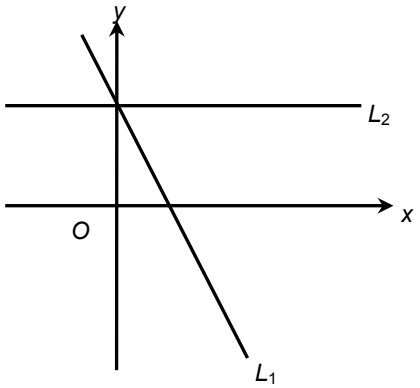
D. $x=-3k$ or $x=5k$

16. In the figure, AC and BD intersect at the x-axis. Find the equation of BD if the equation of AC is $x+y-1=0$.



A. $4x-y-4=0$
B. $4x-y+4=0$
C. $x-4y-4=0$
D. $x-4y+4=0$

17. In the figure, the equations of the straight lines L_1 and L_2 are $ax+by+1=0$ and $cy=1$ respectively. Which of the following is/are true?



I. $a<0$
II. $b<0$
III. $b=c$

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

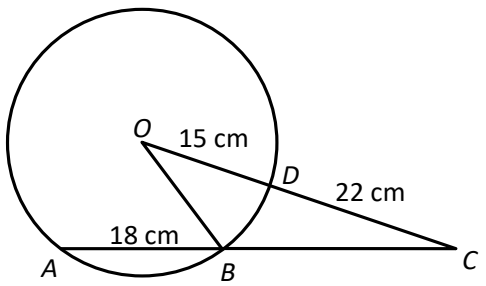
18. The equation of the straight line L_1 is $4x+3y-36=0$. The straight line L_2 is perpendicular to L_1 and intersects L_1 at a point lying on the y-axis. Find the area of the region bounded by L_1, L_2 and the x-axis.

A. 96
B. 108
C. 150
D. 192

19. Find the quotient and the remainder when $3x^3-7x^2-x+2$ is divided by $3x-1$.

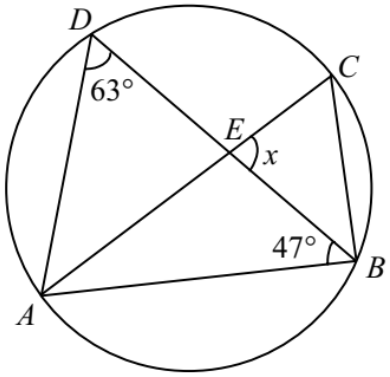
A. Quotient = $x^2 - 2x - 1$, remainder = 1.
B. Quotient = $x^2 - 2x - 1$, remainder = 3.
C. Quotient = $x^2 + 2x - 1$, remainder = 1.
D. Quotient = $x^2 + 2x - 1$, remainder = 3.

20. In the figure, O is the centre of the circle. ABC and ODC are straight lines. $OD = 15$ cm, $CD = 22$ cm and $AB = 18$ cm. Find BC.



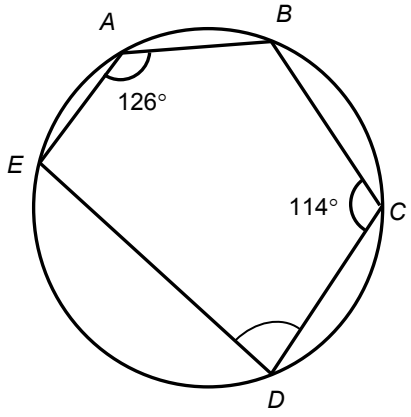
A. 12 cm
B. 26 cm
C. 35 cm
D. 37 cm

21. In the figure, AEC is a diameter and DEB is a straight line. Find x.



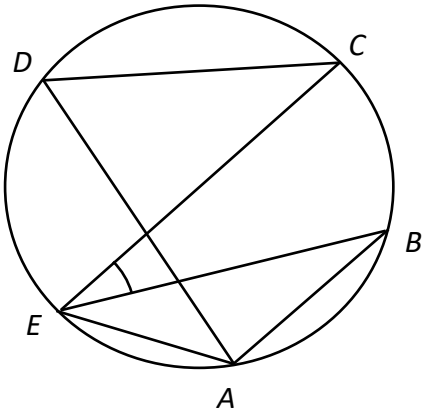
A. 54°
B. 70°
C. 74°
D. 92°

22. In the figure, $\angle BAE = 126°, \angle BCD = 114°$, and $BC = CD$. Find $\angle CDE$.



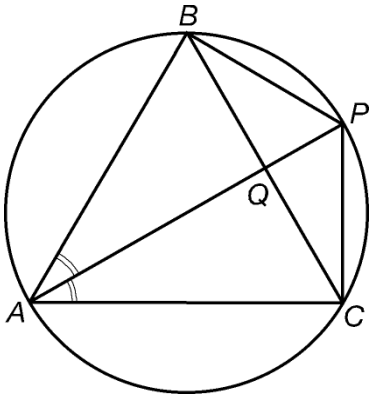
A. 54°
B. 66°
C. 78°
D. 87°

23. In the figure, CE is a diameter of the circle $ABCDE$. If $AB = BC$ and $\angle ABE = 34°$, then $\angle BEC =$



A. 28°.
B. 30°.
C. 32°.
D. 34°.

24. In the figure, AP is the angle bisector of $\angle BAC$. Which of the following is/are true?



I. $\Delta ABQ \cong \Delta ACQ$
II. $\Delta AQC \sim \Delta BQP$
III. $\Delta ACQ \sim \Delta APB$

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

Section B

25. The L.C.M. of $a^2+4a+4,\ a^2-4$ and a^3+8 is

A. $a+2$.

B. $(a-2)(a+2)^2(a^2-2a+4)$.

C. $(a-2)(a+2)^2(a^2+2a+4)$.

D. $(a-2)(a+2)^4(a^2-2a+4)$.

26. $\dfrac{1}{x+y}+\dfrac{2}{x-y}+\dfrac{2y}{x^2-y^2}=$

A. $\dfrac{3}{x-y}$.

B. $\dfrac{3}{x+y}$.

C. $\dfrac{3x+y}{(x+y)(x-y)}$.

D. $\dfrac{3x+2y}{(x+y)(x-y)}$.

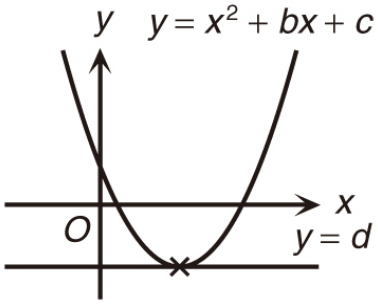
27. α and β are the roots of the equation $x^2+2x-4=0$. Which of the following quadratic equations has roots $\alpha-4$ and $\beta-4$?

A. $x^2+6x+4=0$
B. $x^2+6x+12=0$
C. $x^2+10x+4=0$
D. $x^2+10x+20=0$

28. If $\log x^2=(\log x)^2$, then $x=$

A. 1 .
B. 100.
C. 1 or 10 .
D. 1 or 100 .

29. The figure shows the graphs of $y=d$ and $y=x^2+bx+c$. Which of the following is/are true?



I. $b^2-4c>0$
II. $b^2-4c=0$
III. $b^2=4(c-d)$

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

30. If $\begin{cases} 2^x\cdot 8^y=32 \\ 2^{3x}=\dfrac{1}{2^{y+1}} \end{cases}$, then $x+y=$

A. -2.
B. -1.
C. 1.
D. 2.

31. $\dfrac{a^{\frac{3}{2}}\left(\sqrt[6]{a}\right)^5}{\sqrt[3]{a^{-2}}}=$

A. a^3.
B. a^6.
C. $a^{\frac{5}{3}}$.
D. $a^{\frac{5}{6}}$.

32. Which of the following is/are true?

I. $\log_{100} M^n = n \log_{100} M$

II. $(\log_{100} M)(\log_{100} N) = \log_{100} MN$

III. $10^{2\log_{100} M} = M$

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

33. It is given that $f(x) = 4x^2 - 4x + 13$. Which of the following is/are true?

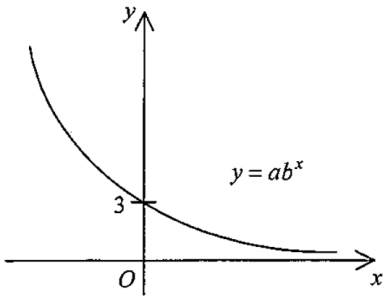
I. The minimum value of $f(x)$ is 12.

II. The axis of symmetry of the graph of $y = f(x)$ is $x = -\frac{1}{2}$.

III. The coordinates of the vertex of the graph of $y = f(-x)$ are $\left(-\frac{1}{2}, 12\right)$.

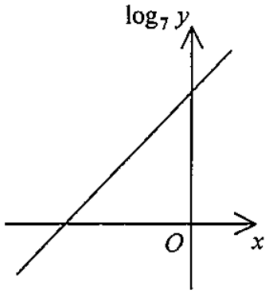
A. I and II only
B. I and III only
C. II and III only
D. I, II and III

34.

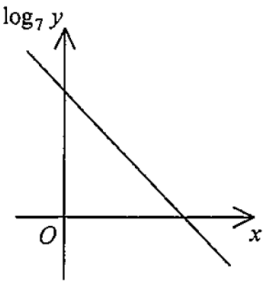


The figure above shows the graph of $y = ab^x$, where a and b are constants. Which of the following graphs may represent the relation between x and $\log_7 y$?

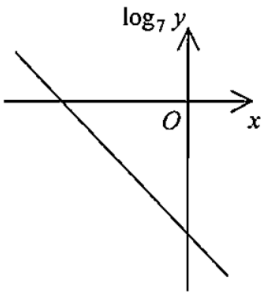
A.



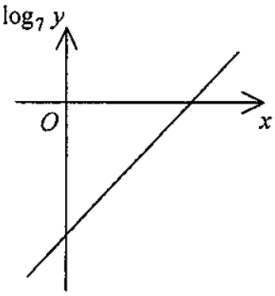
B.



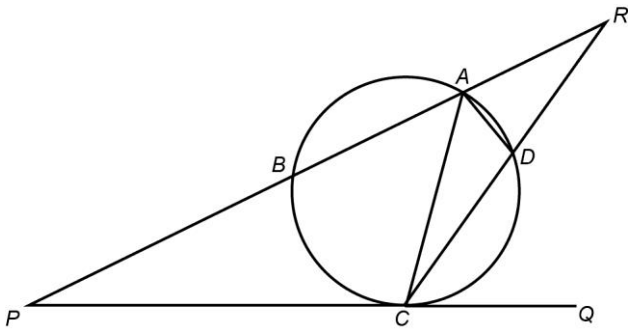
C.



D.

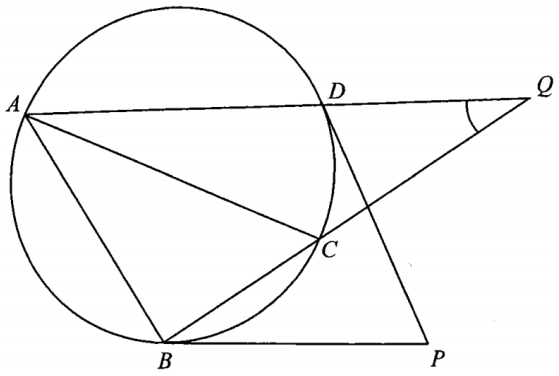


35. The figure shows a circle $ABCD$. PQ is a tangent to the circle at C. It is known that $PBAR$ and CDR are straight lines. If $\angle APC = 26°$, $\angle ADC = 102°$ and AD is the angle bisector of $\angle RAC$, find $\angle ARD$.



A. 52°
B. 48°
C. 38°
D. 24°

36. In the figure, AC is a diameter of the circle $ABCD$. PB and PD are tangents to the circle. AD produced and BC produced meet at Q. If $\angle BPD = 68°$, find $\angle AQB$.



A. 22°
B. 28°
C. 32°
D. 34°

End of Paper