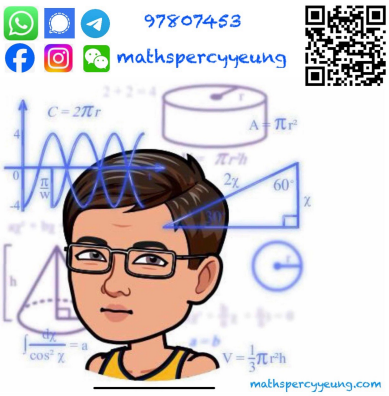
18-19 F.4
2nd TERM EXAM
MATH CP
PAPER 2
MC



2018 – 2019
Form 4 Second Term Examination

MATHEMATICS Compulsory Part

PAPER 2

5th June, 2019. (Wednesday)
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. A seller marked the price of a selfie stick such that he can make a profit of 60 %. During the summer sale, 30 % discount was offered and the selling price of the selfie stick was \$61.6. Find the cost of the selfie stick.

A. \$30.8
B. \$46.2
C. \$55
D. \$58

2. $3a^2 + a - 3b^2 - b =$

A. $(a - b)(3a + 3b + 1)$.
B. $(a - b)(3a - 3b + 1)$.
C. $3(a - b)(a + b + 1)$.
D. $3(a - b)(a - b + 1)$.

3. If a and n are constants and $a > 0$, $\dfrac{a^n \times a^n \times a^n}{a^n + a^n + a^n} =$

A. $\dfrac{1}{3}$.
B. 1.
C. $\dfrac{a^3}{3}$.
D. $\dfrac{a^{2n}}{3}$.

4. Make p the subject of the formula $\dfrac{hp - y}{a} = 2p$.

A. $p = \dfrac{y}{2a - h}$
B. $p = \dfrac{y}{h - 2a}$
C. $p = \dfrac{2a - h}{y}$
D. $p = \dfrac{h - 2a}{y}$

5. Arrange $0.\dot{2}0\dot{1}9$, $0.2\dot{0}\dot{1}9$, $0.20\dot{1}\dot{9}$ in descending order.

A. $0.\dot{2}0\dot{1}9,\ 0.2\dot{0}\dot{1}9,\ 0.20\dot{1}\dot{9}$
B. $0.20\dot{1}\dot{9},\ 0.2\dot{0}\dot{1}9,\ 0.\dot{2}0\dot{1}9$
C. $0.\dot{2}0\dot{1}9,\ 0.20\dot{1}\dot{9},\ 0.2\dot{0}\dot{1}9$
D. $0.2\dot{0}\dot{1}9,\ 0.20\dot{1}\dot{9},\ 0.\dot{2}0\dot{1}9$

6. $\sqrt{98a} - \dfrac{4\sqrt{a}}{\sqrt{2}} =$

A. $\sqrt{6a}$.
B. $3\sqrt{2a}$.
C. $\sqrt{10a}$.
D. $5\sqrt{2a}$.

7. Solve the equation $x(2x - 3) = 9$.

A. $x = -\dfrac{3}{2}$ or -3
B. $x = -\dfrac{3}{2}$ or 3
C. $x = \dfrac{3}{2}$ or -3
D. $x = \dfrac{3}{2}$ or 3

8. If $f(x)=3^x+\frac{1}{3^x}$, $f(x)+f(-x)=$

A. 0.

B. 2.

C. $-2f(x)$.

D. $2f(x)$.

9. Consider the function $y=(1-4x)^{-\frac{1}{2}}$. Find the largest possible domain of the function.

A. $x<\frac{1}{4}$

B. $x\leq\frac{1}{4}$

C. $x>\frac{1}{4}$

D. $x\geq\frac{1}{4}$

10. Which of the following statements about the graph of $y=(2-x)(x+3)-6$ is/are true?

I. The graph opens upwards.

II. The graph passes through the point $(1, -2)$.

III. The x-intercepts of the graph are -3 and 2.

A. **I** only

B. **II** only

C. **I** and **III** only

D. **II** and **III** only

11. Find the quotient when $2x^3+3x^2-5$ is divided by $2x-1$.

A. x^2-x+1

B. x^2-2x+3

C. x^2+2x+1

D. x^2+2x+3

12. If k is a constant such that x^3-3x^2-kx+6 is divisible by $x-2$, find the value of k.

A. 1

B. 7

C. 13

D. 15

13. $\frac{1}{3y-2x}-\frac{1}{2x+3y}=$

A. $\frac{6y}{9y^2-4x^2}$.

B. $\frac{4x}{9y^2-4x^2}$.

C. $\frac{6y}{4x^2-9y^2}$.

D. $\frac{4x}{4x^2-9y^2}$.

14. The x-intercept and y-intercept of the straight line L are k and $-2k$ respectively. If L passes through $P(3, -4)$, find the equation of L.

A. $x-2y-11=0$

B. $x-2y-10=0$

C. $2x-y-11=0$

D. $2x-y-10=0$

15. If the straight lines $L_1: kx-6y+12=0$ and $L_2: 3x+2y-8=0$ are perpendicular to each other, find the value of k.

A. -9

B. -4

C. 4

D. 9

16. In the figure, the equation of the straight line L is $ax + by - 8 = 0$. Which of the following are true?

I. $a < b$

II. $a > 4$

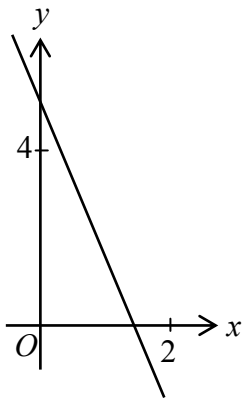
III. $b > 2$

A. **II** only

B. **III** only

C. **I** and **II** only

D. **I** and **III** only



17. $\sqrt[4]{a\sqrt[3]{b}} \times \sqrt{a}\, b^0 =$

A. $a^{\frac{3}{8}} b^{\frac{1}{12}}$.

B. $a^{\frac{3}{8}} b^{\frac{3}{8}}$.

C. $a^{\frac{3}{4}} b^{\frac{1}{12}}$.

D. $a^{\frac{3}{4}} b^{\frac{3}{8}}$.

18. Solve the equation $4^{3x-5} = 8^{x+2}$.

A. $x = \frac{15}{7}$

B. $x = \frac{14}{5}$

C. $x = \frac{16}{3}$

D. $x = 9$

19. If the simultaneous equations $\begin{cases} y = x^2 + 3x + 1 \\ y = 2x + k \end{cases}$ have no real solutions, which of the following can be a possible value of k?

A. 0

B. 2

C. 4

D. 6

20. Find the real root(s) of $\sqrt{7 - 2x} = 2 - x$.

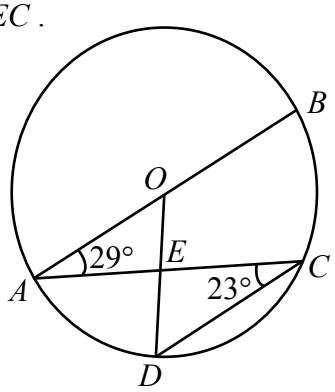
A. $x = -1$

B. $x = 3$

C. $x = -1$ or 3

D. no real solution

21. In the figure, AB is a diameter of the circle $ADCB$ with centre O. AC and OD meet at E. If $\angle CAB = 29°$ and $\angle ACD = 23°$, find $\angle OEC$.



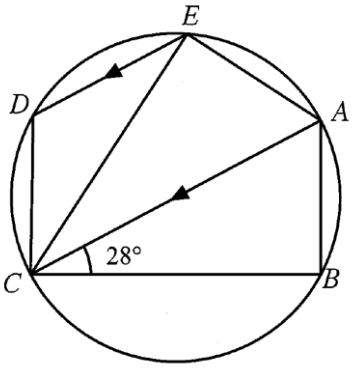
A. 52°

B. 71°

C. 75°

D. 81°

22. In the figure, AC is a diameter of the circle $ABCDE$ and it is also the angle bisector of $\angle BCE$. It is given that $AC \parallel ED$ and $\angle ACE = 28°$. Find $\angle DCE$.



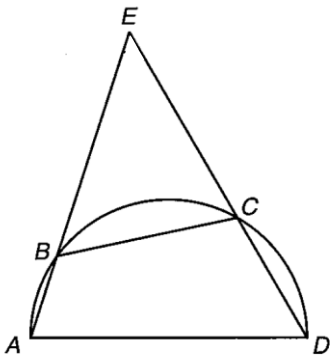
A. 22°

B. 28°

C. 34°

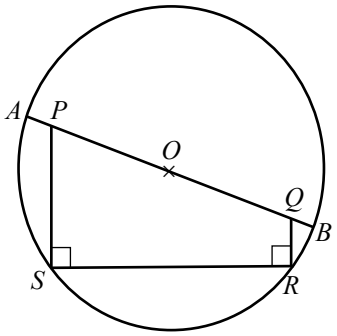
D. 36°

23. In the figure, $ABCD$ is a semi-circle. AB and DC are produced to meet at E. If $AB:BC:CD=3:7:5$, find $\angle AED$.



A. 42°
B. 48°
C. 54°
D. 60°

24. In the figure, O is the centre of the circle $ASRB$ and $APOQB$ is a diameter. PS and QR are perpendicular to SR. If $AB=34$ cm and $SR=30$ cm, find $PS+QR$.



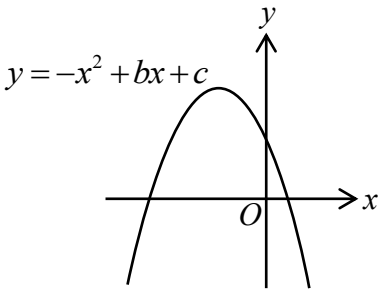
A. 14 cm
B. 15 cm
C. 16 cm
D. 17 cm

Section B

25. If $\alpha \neq \beta$ and $\begin{cases} 2\alpha = 3\alpha^2 - 5 \\ 2\beta = 3\beta^2 - 5 \end{cases}$, find the value of $\alpha + \beta + \alpha\beta$.

A. $-\frac{7}{3}$
B. -1
C. 1
D. $\frac{7}{3}$

26. The figure shows the graph of $y=-x^2+bx+c$.



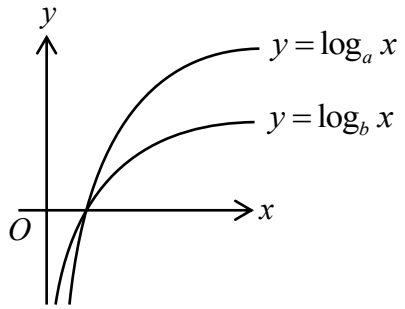
Which of the following is true?
A. $b<0$ and $c<0$
B. $b<0$ and $c>0$
C. $b>0$ and $c<0$
D. $b>0$ and $c>0$

27. The H.C.F. of the polynomials $2x^4-2x^2$ and $2x^4-2$ is
A. $2x^4$
B. $(x+1)(x-1)$
C. $2(x+1)(x-1)$
D. $2x^2(x+1)(x-1)$

28. $\left(\log_x y^4\right)\left(\log_{\sqrt{y}} x^7\right)=$
A. $-\frac{5}{2}$
B. $\frac{7}{12}$
C. 14
D. 56

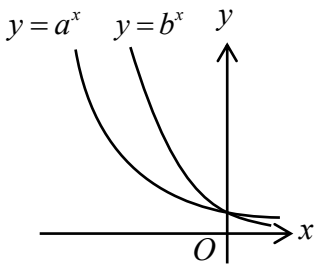
29. If $\log 2=a$ and $\log 3=b$, $\log 0.15=$
A. $b-a-10$.
B. $b-a-1$.
C. $\frac{b-a}{10}$.
D. $\frac{b}{10a}$.

30. The figure shows the graphs of $y = \log_a x$ and $y = \log_b x$.

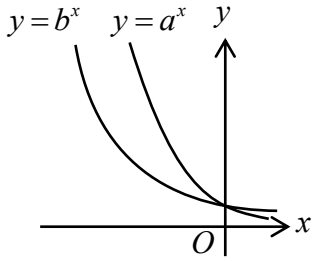


Which of the following can be the graphs of $y = a^x$ and $y = b^x$?

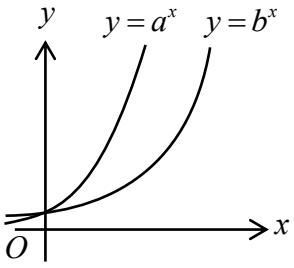
A.



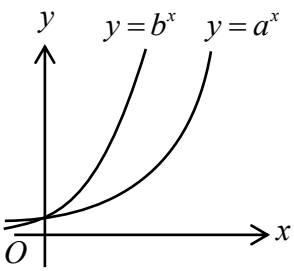
B.



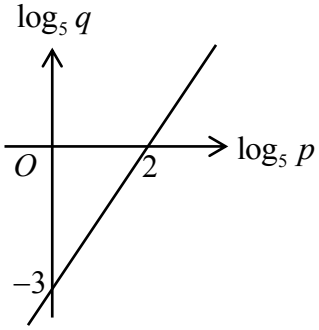
C.



D.



31. In the figure, the graph shows the linear relation between $\log_5 p$ and $\log_5 q$. If k and n are constants such that $p = kq^n$, find the value of k.



A. $\frac{1}{125}$

B. $\frac{2}{3}$

C. $\frac{3}{2}$

D. 25

32. Solve the equation

$$2\log 25x^2 - (\log 5x)^2 = 3 \ .$$

A. $x = 1$ or 3

B. $x = 2$ or 200

C. $x = 5$ or 500

D. $x = 10$ or 1000

33. If $-1 + 3i$ and $-1 - 3i$ are the roots of the equation $x^2 + ax + b = 0$ where a and b are real constants, find the values of $a + b$.

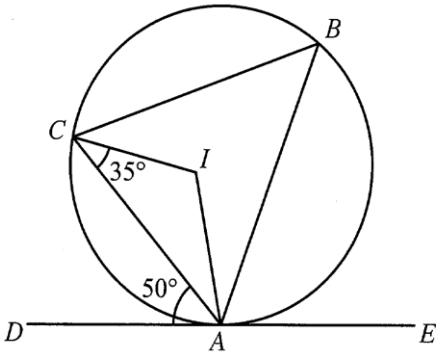
A. –10

B. –6

C. 8

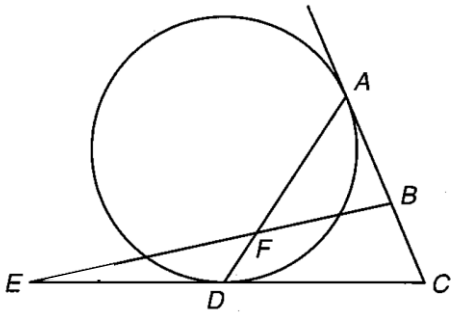
D. 12

34. In the figure, I is the incentre of $\angle ABC$. DE is the tangent to the circle ABC at A. If $\angle ACI = 35°$ and $\angle CAD = 50°$, find $\angle AIC$.



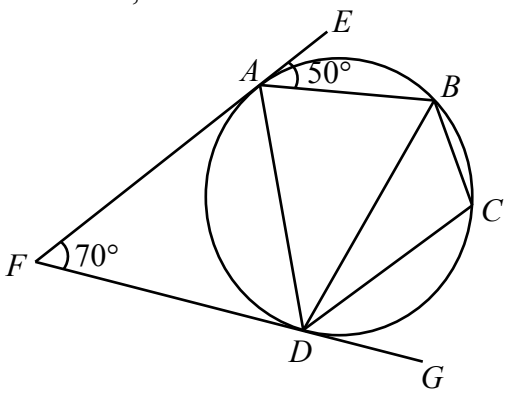
A. 100°.
B. 105°.
C. 110°.
D. 115°.

35. In the figure, ABC and CDE are tangents to the circle at A and D respectively. AD and BE intersect at F. If $\angle ABE = 50°$ and $\angle AFE = 120°$, find $\angle BEC$.



A. 10°.
B. 15°.
C. 20°.
D. 25°.

36. In the figure, EF and FG are the tangents to the circle $ABCD$ at A and D respectively. If $\angle EFG = 70°$, $\angle EAB = 50°$ and $AD = DC$, find $\angle BDC$.



A. 20°
B. 25°
C. 30°
D. 35°

END OF PAPER