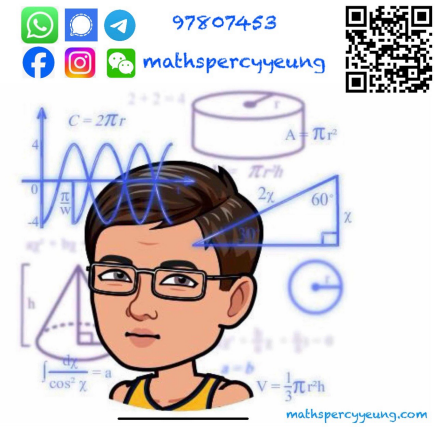
19-20 F.4
2nd TERM EXAM
MATH CP
PAPER 2
MC



2019 – 2020
Form 4 Second Term Examination

MATHEMATICS Compulsory Part

PAPER 2

24th June, 2020. (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. 0.085 274 63 =

A. 0.08 (correct to 2 decimal places).
B. 0.085 (correct to 3 significant figures).
C. 0.0853 (correct to 4 decimal places).
D. 0.085 27 (correct to 5 significant figures).

2. $au + bu - cu - av - bv + cv =$

A. $(a + b + c)(u + v)$.
B. $(a - b + c)(v - u)$.
C. $(a - b - c)(u + v)$.
D. $(a + b - c)(u - v)$.

3. If $s = \frac{2u+3v}{3u-4v}$, then $u =$

A. $\frac{2s+3v}{3s-4v}$.
B. $\frac{4s-3v}{2s+3v}$.
C. $\frac{(4s+3)v}{3s-2}$.
D. $\frac{(4s+3)v}{2-3s}$.

4. A sum of \$4000 is deposited in a bank at an interest rate 4% p.a. for 5 years, compounded quarterly. Find the interest correct to the nearest dollar.

A. \$800
B. \$867
C. \$876
D. \$881

5. Which of the following numbers is a rational number?

I. $0.\dot{1}2\dot{5}$
II. $\sqrt{4}$
III. $2\frac{5}{16}$

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

6. $\frac{\sqrt{121a}}{\sqrt{242}} =$

A. $\sqrt{2a}$.
B. $2\sqrt{2}a$.
C. $\frac{\sqrt{2a}}{2}$.
D. $\frac{a}{2}$.

7. Let k be a constant. If the quadratic equation $x^2 + kx + 4 = x$ has equal roots, then $k =$

A. –3 or 5.
B. –5 or 3.
C. –3 or –5.
D. 3 or 5.

8. If $x^2 - \sqrt{5}x - 5 = 0$, then $x =$

A. $\sqrt{5}$.
B. 0 or $\sqrt{5}$.
C. $\frac{5 \pm 2\sqrt{5}}{2}$.
D. $\frac{\sqrt{5} \pm 5}{2}$.

9. If $f(x) = 2x - 3, f(2x + 3) =$

A. $4x + 3$.

B. $4x - 3$.

C. $4x + 6$.

D. $4x - 6$.

10. Which of the following is a function of x?

I. $y = \dfrac{1}{\sqrt{x^2 + 3}}$

II. $y = x^3 - \dfrac{1}{x^2}$, where $x \neq 0$

III. $y^2 = 1 - x$, where $x \leq 1$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

11. Consider the function $f(x) = 2 - x^2$. Which of the following may be a range of $f(x)$?

A. All real numbers smaller than 2

B. All real numbers smaller than or equal to 2

C. All real numbers greater than 2

D. All real numbers greater than or equal to 0

12. Which of the following about the graph of $y = 3(x - 2)^2 + 5$ must be true?

A. The y-intercept is 5.

B. The graph has no x-intercepts.

C. The coordinates of the vertex are $(2, -5)$.

D. The equation of the axis of symmetry is $x = -2$.

13. When a polynomial $f(x)$ is divided by $4x^2 - 5x + 1$, the quotient and the remainder are $4x + 3$ and $2 - 6x$ respectively. Find $f(x)$.

A. $16x^3 - 8x^2 - 17x - 5$

B. $16x^3 - 8x^2 - 17x + 5$

C. $16x^3 - 20x^2 - 17x + 2$

D. $16x^3 - 17x^2 - 17x + 5$

14. Let $p(x) = mx^3 - x^2 + n$, where m and n are constants. If $p(x)$ is divisible by $x - 2$, find the remainder when $p(x)$ is divided by $x + 1$.

A. $-9m + 3$

B. $-8m + 4$

C. $-7m + 6$

D. $-4m$

15. The straight lines L and $4x + 3y - 8 = 0$ intersect at a point on the x–axis. If the y-intercept of L is 3, then the equation of L is

A. $2x - 3y + 6 = 0$.

B. $2x + 3y - 6 = 0$.

C. $3x + 2y - 6 = 0$.

D. $3x - 2y + 6 = 0$.

16. Consider two straight lines L_1: $2x - 4y + 7 = 0$ and L_2: $x - 2y + 7 = 0$. Which of the following must be true?

I. L_1 and L_2 are parallel to each other.

II. L_1 and L_2 have one point of intersection.

III. L_1 and L_2 have the same y-intercept.

A. I only

B. II only

C. III only

D. I and III only

17. If the straight line $4x + y - 167 = 0$ is perpendicular to the straight line $4x + ky - 167 = 0$, then $k =$

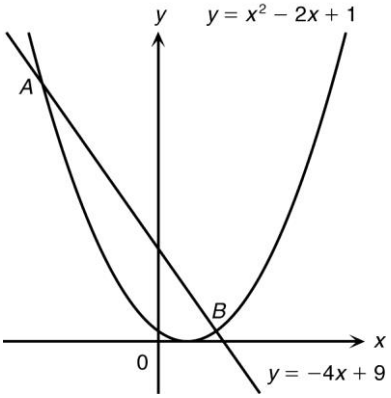
A. -16.
B. -1.
C. 1.
D. 16.

18. $\sqrt[4]{\sqrt{x}} =$

A. $\sqrt[5]{x}$.
B. $\sqrt[6]{x}$.
C. $\sqrt[8]{x}$.
D. $\sqrt[10]{x}$.

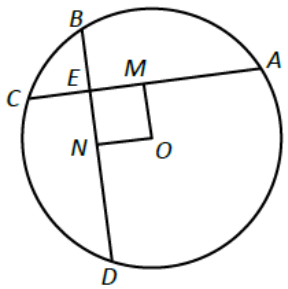
19. In the figure, the straight line $y = -4x + 9$ cuts the quadratic curve $y = x^2 - 2x + 1$ at A and B. Find the coordinates of A.

A. $(1, 2)$
B. $(2, 1)$
C. $(-1, 13)$
D. $(-4, 25)$



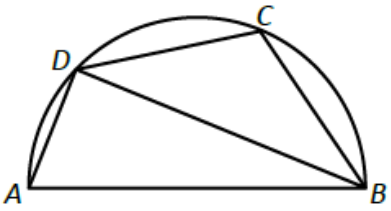
20. In the figure, O is the centre of circle $ABCD$. Chords AC and BD intersect at E. If $AM = MC = 12$, $BN = ND$, $OM = ON$ and $NE = 5$, then $BE =$

A. 6.
B. 7.
C. 8.
D. 9.



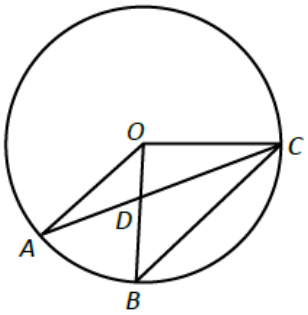
21. In the figure, $ABCD$ is a semi-circle. If $\angle ABD = 22°$, then $\angle BCD =$

A. 116°.
B. 112°.
C. 108°.
D. 104°.



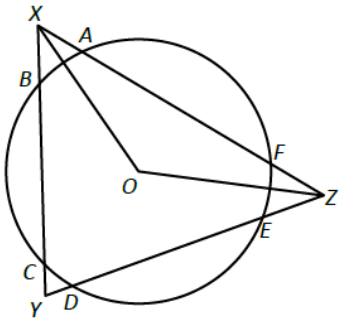
22. In the figure, O is the centre of circle ABC. OB and AC intersect at D. If $AO \parallel BC$ and $\angle ADB = 66°$, then $\angle AOB =$

A. 22°.
B. 33°.
C. 44°.
D. 66°.



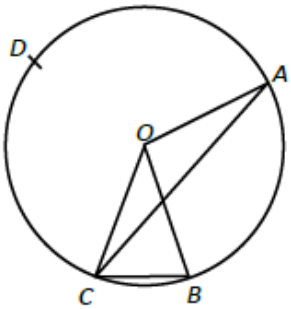
23. In the figure, O is the centre of circle $ABCDEF$. $\triangle XYZ$ intersects the circle at A, B, C, D, E and F. If $\angle XOZ = 132°$ and $BC = DE = FA$, then $\angle XYZ =$

A. 48°.
B. 66°.
C. 80°.
D. 84°.



24. In the figure, O is the centre of circle $ABCD$. If $\overset{\frown}{AB} : \overset{\frown}{CDA} = 1 : 3$ and $\angle BOC = 40°$, then $\angle ACB =$

A. 40°.
B. 42°.
C. 44°.
D. 46°.



Section B

25. Form a quadratic equation in x whose roots are $2+\sqrt{5}$ and $2-\sqrt{5}$.

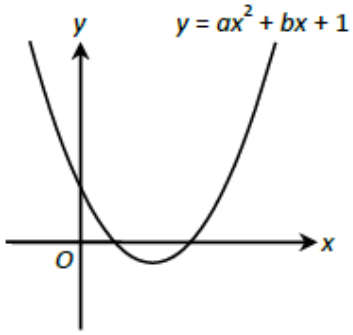
A. $x^2-4x-1=0$

B. $x^2+4x-1=0$

C. $x^2-4x+1=0$

D. $x^2+4x+1=0$

26. The figure shows the graph of $y = ax^2 + bx + 1$, where a and b are constants. Which of the following must be true?



A. $a < 0$ and $b < 0$

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

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

D. $a > 0$ and $b > 0$

27. The L.C.M. of $6a^3b$, $8a^2b^2$, $20a^4$ is

A. $2a^2$.

B. $2a^2b$.

C. $120a^4b^2$.

D. $120a^{11}b^3$.

28. If $\log 2 = a$ and $\log 3 = b$, then $\log_6 5 =$

A. $\dfrac{\log(1-a)}{\log(a+b)}$.

B. $\dfrac{1}{\log(a+b)}$.

C. $\dfrac{1-a}{a+b}$.

D. $\dfrac{1}{a(a+b)}$.

29. Solve $81x^4-97x^2+16=0$.

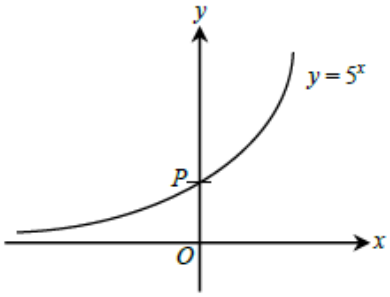
A. $x=-\dfrac{2}{3}$ or $\dfrac{2}{3}$

B. $x=-\dfrac{4}{9}$ or $\dfrac{4}{9}$

C. $x=-1,\ -\dfrac{2}{3},\ \dfrac{2}{3}$ or 1

D. $x=-1,\ -\dfrac{4}{9},\ \dfrac{4}{9}$ or 1

30. The figure shows the graph of $y = 5^x$. The coordinates of P are



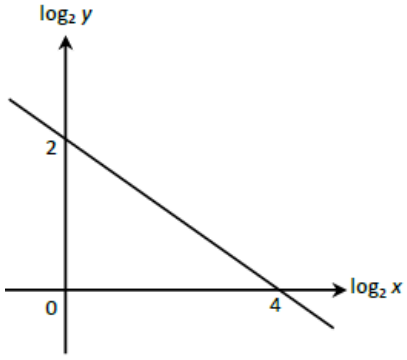
A. (1, 0).

B. (0, 1).

C. (5, 0).

D. (0, 5).

31. In the figure, the graph shows the linear relation between $\log_2 y$ and $\log_2 x$. Which of the following must be true?



A. $x^{\frac{1}{2}}y=2$

B. $x^{\frac{1}{2}}y=4$

C. $xy=2$

D. $xy=4$

32. $\dfrac{1}{x^2-4x+4}-\dfrac{1}{x^2-3x+2}=$

A. $\dfrac{2x-3}{(x-1)(x-2)^2}$.

B. $\dfrac{1}{(x-1)(x-2)^2}$.

C. $-\dfrac{3}{(x-1)(x-2)^2}$.

D. $-\dfrac{3}{(x-1)(x-2)}$.

33. $(7-i)(5+i)=$

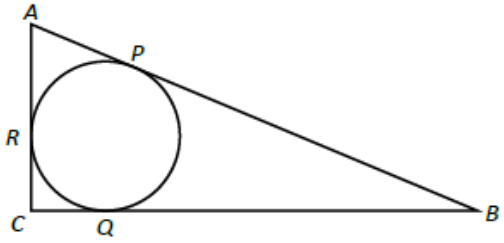
A. $34-2i$.

B. $34+2i$.

C. $36-2i$.

D. $36+2i$.

34. In the figure, $\angle ACB = 90°$. PQR is the inscribed circle of $\triangle ABC$. If $AC = 5$ and $BC = 12$, then the radius of the circle is



A. 2 .

B. 4 .

C. 5.

D. 7.

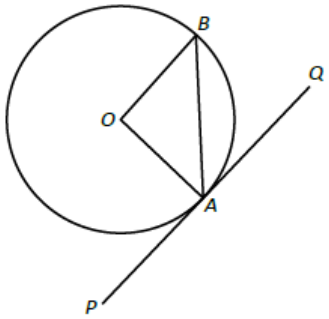
35. In the figure, PAQ is the tangent to the circle AB at A. O is the centre of the circle. If $\angle BAQ = 46°$, then $\angle AOB =$

A. 98° .

B. 92° .

C. 88° .

D. 80° .



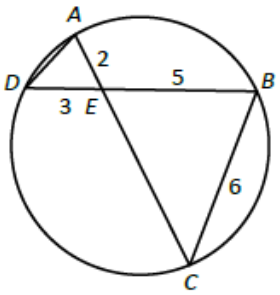
36. In the figure, $ABCD$ is a circle. AC and BD meet at E. If $AE = 2$, $DE = 3$, $BE = 5$ and $BC = 6$, then $CE =$

A. 2.4.

B. 4.

C. 6.

D. 7.5.



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