SULIT

NAMA :

KELAS :

ANGKA GILIRAN :

SMJK PEREMPUAN CHINA PULAU PINANG

PERCUBAAN SIJIL PELAJARAN MALAYSIA 2009

ADDITIONAL MATHEMATICS **3472/1**

Kertas 1

2 jam **Dua jam**

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nama, kelas dan angka giliran** *anda pada petak yang disediakan.*
2. *Calon dikehendaki menjawab semua soalan dalam kertas soalan ini.*
3. *Kertas soalan ini mengandungi 16 halaman bercetak.*

Untuk Kegunaan Pemeriksa		
Soalan	Markah Penuh	Markah Diperoleh
1	3	
2	4	
3	3	
4	4	
5	3	
6	3	
7	2	
8	3	
9	4	
10	4	
11	4	
12	3	
13	3	
14	3	
15	3	
16	4	
17	2	
18	4	
19	3	
20	4	
21	4	
22	3	
23	2	
24	3	
25	2	
Jumlah	80	

 © Hak Cipta SMJK Perempuan China Pulau Pinang

 © Hak Cipta SMJK Perempuan China Pulau Pinang

 © Hak Cipta SMJK Perempuan China Pulau Pinang

 © Hak Cipta SMJK Perempuan China Pulau Pinang

1 The diagram 1 shows the function $f(x) = 2\sin x$, for the domain $0^0 \le x \le 180^0$.

[3 *marks*]

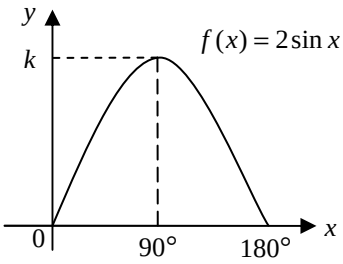

Diagram 1

State

a) the value of *k*.

b) the type of relation.

Answer: a) k =..……..

b) ……..

---

2 Given the functions $k : x \to \dfrac{px+5}{x-3}, x \ne 3$ and $k^{-1} : x \to \dfrac{qx+5}{x-2}, x \ne 2$. Find

a) the values of p and q.

b) the value of x such that $k(x) = k^{-1}(3)$. [4 *marks*]

Answer: a) p =..……..

q =……

b) ……..

3 The function f is defines as $f : x \rightarrow \frac{2}{x+1}$. Find the values of x for which $f = ff$.

[3 *marks*]

Answer: $x =$…..……..

---

4 If the root of the quadratic equation $hx^2 + 21x + 10 = 0$, $h \neq 0$ are in the ratio 2 : 5, find the possible value of h. [4 *marks*]

Answer: $h =$ ……..

5 The graph of the function $y = p - (x - q)^2$ intersects the x-axis at the points (1, 0) and (3, 0). Find

(a) Find the values of p and q.

(b) the maximum value of y. [3 marks]

Answer: (a) p =..……..

q =……...…..…..

(b) y =…...…….

---

6 Given that $2x + 3y - 5 = 0$, find the range of values of x if $y < 6$. [3 *marks*]

Answer: …..……..

7 Simplify $2^{10n} \times 7^{4n} \div 2^{2n}$. [2 *marks*]

Answer: …..……..

---

8 Given that $x = 10^{\sqrt{2}}$ and $\log y = \sqrt{3}$. Find the values of

$\log\left(x^3 - x^2 y\right) + \log\left(\frac{x}{y^6} + \frac{1}{y^5}\right) - 2\log\sqrt{\left(x^2 - y^2\right)}$. [3 *marks*]

Answer: … ……..

---

9 An arithmetic progression has nine terms. The eighth term is 28 while the sum of all the odd terms is 95. Find the first term and the common difference. [4 *marks*]

Answer: a = ……..
d = ……..

 © Hak Cipta SMJK Perempuan China Pulau Pinang

10 The first three terms of a geometric progression are 1, x and y while the first three terms of an arithmetic progression are 1, y and x, where $x \neq y \neq 1$. Find the values of x and y. [4 *marks*]

Answer: x = ……..
y = ……..

---

11 Sum of the first n terms of geometric progression is $1+\frac{5}{4}+\left(\frac{5}{4}\right)^2+...$. Find the smallest number of term to show that the sum of the first n terms is more than 20.

[4 *marks*]

Answer: n = ……..

 © Hak Cipta SMJK Perempuan China Pulau Pinang

12 A straight line graph is obtained by plotting $\frac{y}{x^2}$ against x^2, as shown in diagram 2 for the positive values of variables x and y.

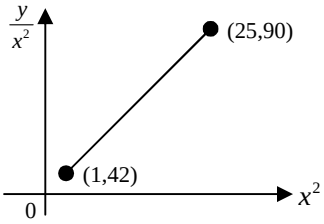

Diagram 2

Find

a) y in terms of x.

b) value of y when $x = 3$. [3 *marks*]

Answer: a) …..…..……..

b) ……..

---

13 The diagram 3 shows the triangle with vertices *P* (2, 1), *Q* (-1, 4) and *R*. The gradients of the lines *PQ*, *PR* and *QR* are -2*m*, 2*m* and *m* respectively.

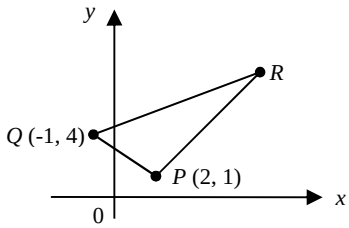

Diagram 3

Find

a) the value of *m*.

b) the equation of the lines *PR*. [3 *marks*]

Answer: a) *m* =…..……..

b) ……..

14 Point P (x, y) moves in such a way that its distance from point Q (3, 1) is always two times its perpendicular distance from the straight line $x = -1$. Find the equation of the locus of the moving point P. [3 *marks*]

Answer: …..……..

15 The diagram 4 shows a parallelogram $PQRS$. Given $\overrightarrow{PQ} = 4\underset{\sim}{p}$, $\overrightarrow{PS} = 2\underset{\sim}{q}$, M is the midpoint of $\overrightarrow{SR}$ and $\overrightarrow{SN} = \frac{1}{3}\overrightarrow{SQ}$.

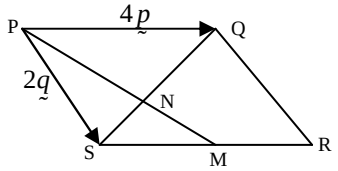

Diagram 4

Express $\overrightarrow{NP}$ in terms of $\underset{\sim}{p}$ and $\underset{\sim}{q}$. [3 *marks*]

Answer: $\overrightarrow{NP}$ = …..……..

16 Given that $\underset{\sim}{p} = \begin{pmatrix} 3 \\ -9 \end{pmatrix}$, $\underset{\sim}{q} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$ and $\underset{\sim}{r} = \begin{pmatrix} -8 \\ 5 \end{pmatrix}$. Find the unit vector in the direction of $3\underset{\sim}{r} - 4\underset{\sim}{p}$. [4 *marks*]

Answer: ...……..……..……..

---

17 Given that $\tan\theta = t$, where θ is an acute angle. Express $\cos\left(180^0 - \theta\right)$ in terms of *t*.

[2 *marks*]

Answer: …..……..

18 The diagram 5 shows the sector AOB of a circle with centre O.

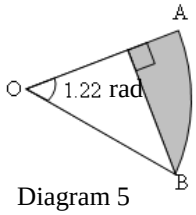

Diagram 5

The area of the sector is 44.08 cm^2. Find

(a) the length of OA.

(b) the area of the shaded region. [4 *marks*]

Answer: a) *OA* =…...……..

b) ……..

---

19 The equation $y = 2x + \frac{3}{x}$ shows the relationship between two quantities *x* and *y*. Given that *y* increases at a constant rate of 5 units s^{-1}. Find the rate of change of *x* when *x*=2. [3 *marks*]

Answer: …..……...

20 The tangent to the curve $y = ax^2 + bx$ at the point $A(1,6)$ crosses the y-axis at $B(0,-2)$. Find the values of a and b. [4 *marks*]

Answer: a = …..……..
b =…...……..

---

21 Given that $y = \dfrac{x^2}{3x-2}$ and $\dfrac{dy}{dx} = 3f(x)$, such that $f(x)$ is a function in terms of x. Find the value of $\int_{-2}^{3} f(x)dx$. [4 *marks*]

Answer: …..……..

22 The diagram 6 shows the number of questions attempted by a number of students in a Mathematics quiz.

Number of questions, x	1	2	3	4	5	6
Number of students, f	8	12	4	y	2	2

Diagram 6

Find

a) the maximum values of y if the mode is 2.

b) the minimum values of y if the mean is more than 3. [3 *marks*]

Answer: a) …..……..……..

b) ……..

23 Diagram 7 below shows a road system. A man walks from P to Y by following the arrows direction. What is the probability the man walk cross WX if given that every ends of roads have 2 choices, with the probability he choose each road is the same.

[2 *marks*]

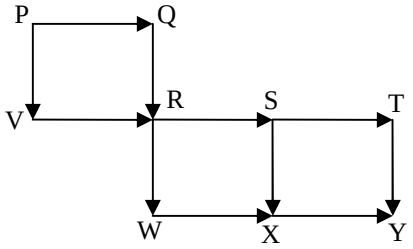

Diagram 7

Answer: …..……..

24 A school parent-teacher committee of 10 members is to be formed from 9 parents, 5 teachers and the principal. Find the number of ways in which this can be done, if

a) the principal is included,

b) the committee has at least 3 teachers. [3 *marks*]

Answer: a) …..…..……..

b) ……..

25 The diagram 8 shows a probability distribution graph of the continuous random variable X that is normally distributed with a standard distribution with a standard deviation of 3. The graph is symmetrical about the vertical line PQ.

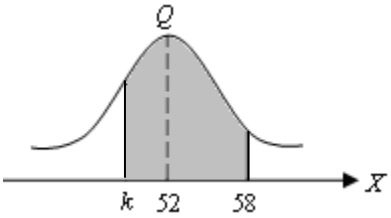

Diagram 8

If the standard score found by standardizing the value of $x = k$ is $-\frac{2}{3}$, find the value of k.

[2 *marks*]

Answer: k =…..……..

Prepared by: PUI YC

Checked by: Pn Chuah Guat Beng

Verified by: Pn Tay Yoke Chew