

**3472/1(PP)
Tingkatan
Lima
Additional
Mathematics
Kertas 1
Peraturan
Pemarkahan
Oktober
2020**

PEPERIKSAAN PERCUBAAN SPM 2020

**ADDITIONAL MATHEMATICS
Tingkatan 5**

KERTAS 1

PERATURAN PEMARKAHAN

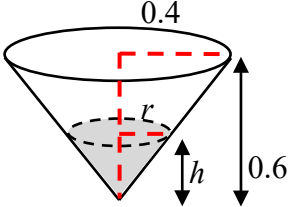
UNTUK KEGUNAAN PEMERIKSA SAHAJA

ADDITIONAL MATHEMATICS TRIAL SPM PAPER 1 2020

Question	Solutions and marking scheme	Sub Marks	Full Marks
<p>1 (a)</p> <p>(b)</p>	<p>$5\hat{i} + 3\hat{j}$</p> <p>$\begin{pmatrix} 8 \\ -4 \end{pmatrix}$</p>	<p>1</p> <p>1</p>	<p>2</p>
<p>2</p>	<p>$\frac{x}{y} = x + 6$</p> <p>B1 : $m = \frac{9-6}{3-0}$</p>	<p>2</p>	<p>2</p>
<p>3</p>	<p>$r = -3, s = -\frac{5}{2}$ (both)</p> <p>B2 : $r^2 = 9$ or 1</p> <p>B1 : $r(rx - s) - s = 9x - 5$</p>	<p>3</p>	<p>3</p>
<p>4</p>	<p>$p = -\frac{1}{3}$ and $q = \frac{7}{3}$</p> <p>B1 : $p = -\frac{1}{3}$ or $q = \frac{7}{3}$</p>	<p>2</p>	<p>2</p>
<p>5</p>	<p>$12x^2 - 11x + 2 = 0$</p> <p>B1 : $SOR = \frac{11}{12}$ or $POR = \frac{2}{12}$ OR $(3x - 2)(4x - 1) = 0$</p>	<p>2</p>	<p>2</p>
<p>6(a)</p> <p>(b)</p>	<p>$x = 2$</p> <p>$-\frac{1}{3}$</p>	<p>1</p> <p>1</p>	<p>2</p>

<p>7</p>	$\frac{n^5}{m}$ <p>B3 : $\frac{m^2 n^2}{m^3 n^{-3}}$ or $\frac{1}{5^x} (5^y)^5$</p> <p>B2 : $\frac{(5^x)^2 (5^y)^2}{(5^x)^3 (5^y)^{-3}}$ or $5^{2(x+y)-3(x-y)}$</p> <p>B1 : Seen $5^{2(x+y)}$ or $5^{3(x-y)}$</p>	<p>4</p>	<p>4</p>
<p>8</p>	<p>$x = 2$</p> <p>B3 : $0.3011x = 0.6021$ OR $2x - 2 = x$</p> <p>B2 : $x \log_{10} 3 + (x-1) \log_{10} 4 = x \log_{10} 6$ OR $2^{2x-2} = 2^x$</p> <p>B1: $\log_{10}(3^x)(4^{x-1}) = \log_{10} 6^x$ OR $4^{x-1} = \frac{6^x}{3^x}$ or $4^{x-1} = \left(\frac{6}{3}\right)^x$</p>	<p>4</p>	<p>4</p>
<p>9</p>	<p>$a = \sqrt{10}$ and $b = 3\sqrt{10}$</p> <p>B2 : $a = \sqrt{10}$ or $b = 3\sqrt{10}$</p> <p>B1 : $a^2 + (3a)^2 = 10^2$</p>	<p>3</p>	<p>3</p>
<p>10</p>	<p>$B(2,3)$</p> <p>B2 : $-\frac{1}{2}x + 4 = 2x - 1$</p> <p>B1 : $m = -\frac{1}{2}$</p>	<p>3</p>	<p>3</p>
<p>11(a)</p> <p>(b)</p>	<p>$a = 27$</p> <p>B1 : $\frac{10}{2}[2a + 9(-5)] = 45$</p> <p>$-3$</p> <p>B1 : $T_7 = 27 + 6(-5)$</p>	<p>2</p> <p>2</p>	<p>4</p>

<p>12</p>	$\frac{39}{110}$ $B2 : 0.3 + \frac{0.054}{1 - 0.01}$ $B1 : a = 0.054 \text{ and } r = \frac{0.00054}{0.054} = 0.01$	<p>3</p>	<p>3</p>																								
<p>13</p>	<p>5, 5, 6, 7, 12 or 5, 5, 6, 8, 11 or 5, 5, 6, 9, 10</p> $B3 : x + y = 16$ $B2 : \frac{5 + 5 + 6 + x + y}{5} = 7$ $B1 : \underline{5} \ \underline{5} \ \underline{6} \ \underline{x} \ \underline{y}$	<p>4</p>	<p>4</p>																								
<p>14</p>	<p>Eric is not qualifying, because his marks $24 < 24.5$.</p> $B3: \text{Median} = 19.5 + \left(\frac{\frac{30}{2} - 9}{12} \right) (10)$ $B2 : L = 19.5 \text{ or } f = 12 \text{ or } F = 9 \text{ or } c = 10$ $B1 : \text{Median class} = 20 - 29$ <p><i>Notes:</i></p> <table border="1" data-bbox="343 1361 991 1861"> <thead> <tr> <th>Marks</th> <th>Lower Boundary</th> <th>Frequency</th> <th>Cumulative Frequency</th> </tr> </thead> <tbody> <tr> <td>0 – 9</td> <td>0</td> <td>5</td> <td>5</td> </tr> <tr> <td>10 – 19</td> <td>9.5</td> <td>4</td> <td>9</td> </tr> <tr> <td>20 – 29</td> <td>19.5</td> <td>12</td> <td>21</td> </tr> <tr> <td>30 – 39</td> <td>29.5</td> <td>8</td> <td>28</td> </tr> <tr> <td>40 – 49</td> <td>39.5</td> <td>2</td> <td>30</td> </tr> </tbody> </table> <p>** Not accept without working.</p>	Marks	Lower Boundary	Frequency	Cumulative Frequency	0 – 9	0	5	5	10 – 19	9.5	4	9	20 – 29	19.5	12	21	30 – 39	29.5	8	28	40 – 49	39.5	2	30	<p>4</p>	<p>4</p>
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<p>15</p>	<p>0.00324π or 0.01018</p> <p>B3: $\frac{dV}{dt} = \frac{4(3)}{27} \pi (0.27)^2 \times 0.1$</p> <p>B2: $V = \frac{1}{3} \pi \left(\frac{2}{3} h \right)^2 h$</p> <p>B1: $\frac{r}{0.4} = \frac{h}{0.6}$</p> 	<p>4</p>	<p>4</p>
<p>16</p>	<p>(2, 3) is a minimum point.</p> <p>B2: $\frac{d^2y}{dx^2} = 16 + \frac{4}{2^3}$</p> <p>B1: $\frac{d^2y}{dx^2} = 16 - (-2)2x^{-2-1}$</p>	<p>3</p>	<p>3</p>
<p>17(a)</p> <p>(b)</p>	<p>14</p> <p>$k = 2$</p> <p>B1: $14 + \left[\frac{kx^2}{2} \right]_0^5 = 39$</p>	<p>1</p> <p>2</p>	<p>3</p>
<p>18</p>	<p>$x = 90^\circ, 123.69^\circ, 270^\circ, 303.69^\circ$</p> <p>B2: $\cos x = 0$ and $3 \cos x + \sin x = 0$ or $\tan x = -\frac{3}{2}$</p> <p>B1: $3 \cos^2 x + 2 \sin x \cos x = 0$</p>	<p>3</p>	<p>3</p>
<p>19(a)</p> <p>(b)</p>	<p>$\frac{1}{q}$</p> <p>$-2q \sqrt{1 - q^2}$</p> <p>B2: $2 \left(\frac{q}{1} \right) \left(-\frac{\sqrt{1 - q^2}}{1} \right)$</p> <p>B1: $2 \sin \theta \cos \theta$</p>	<p>1</p> <p>3</p>	<p>4</p>

<p>20</p>	<p>59 cm²</p> <p>B2 : $\frac{1}{2}(10)^2(1.5) - \frac{1}{2}(8)^2(0.5)$</p> <p>B1 : $\frac{1}{2}(10)^2(1.5)$ or $\frac{1}{2}(8)^2(0.5)$</p>	<p>3</p>	<p>3</p>
<p>21(a)</p>	<p>$\frac{1}{16}$</p> <p>B1 : $\frac{\pi(x)^2}{\pi(4x)^2}$</p>	<p>2</p>	<p>4</p>
<p>(b)</p>	<p>Method and Reason</p> <p>B1 : Method or reason</p> <p>Method : Added the radius of small circle <i>Cara : Menambahkan jejari bulatan kecil</i></p> <p>Reason : increase the value of probability <i>Sebab: untuk meningkatkan nilai kebarangkalian.</i></p>	<p>2</p>	
<p>22(a)</p>	<p>120</p> <p><i>Note:</i> ${}^3C_1({}^5C_3)({}^4C_1)$</p>	<p>1</p>	<p>4</p>
<p>(b)</p>	<p>315</p> <p>B2 : ${}^3C_1({}^5C_2)({}^4C_2) + {}^3C_1({}^5C_3)({}^4C_1) + {}^3C_1({}^5C_4)({}^4C_0)$</p> <p>B1 : ${}^3C_1({}^5C_2)({}^4C_2)$ or ${}^3C_1({}^5C_3)({}^4C_1)$ or ${}^3C_1({}^5C_4)({}^4C_0)$</p>	<p>3</p>	
<p>23</p>	<p>64 meter</p> <p>B2 : The maximum point (4, 64)</p> <p>B1 : $-4[(t - 4^2) - (-4)^2]$</p>	<p>3</p>	<p>3</p>

<p>24</p>	$k < -\frac{3}{2}$ $\text{B2 : } (-2)^2 - 4(2)(1+k) > 0$ $\text{B1 : } 2x^2 - 2x + 1 + k = 0$	<p>3</p>	<p>3</p>
<p>25(a)</p>	$\frac{3}{8}$ $\text{B1 : } \frac{1}{16} + \frac{1}{4} + k + \frac{1}{4} + \frac{1}{16} = 1$	<p>2</p>	<p>4</p>
<p>(b)</p>	$\frac{5}{16}$ $\text{B1 : } \frac{1}{4} + \frac{1}{16}$	<p>2</p>	