

3472/1 (PP)  
Additional  
Mathematics  
Kertas 1  
Peraturan  
Pemarkahan  
Okt/Nov 2011



JABATAN PELAJARAN NEGERI TERENGGANU

**PEPERIKSAAN AKHIR TAHUN 2011  
TINGKATAN 4**

**3472/1**

**ADDITIONAL MATHEMATICS**

**Kertas 1  
Okt/Nov 2011  
2 jam**

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**ADDITIONAL MATHEMATICS**

**KERTAS 1**

**PERATURAN PEMARKAHAN**

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2

3472/1(PP)

**INSTRUCTIONS FOR EXAMINERS****1. MARKING GUIDE**

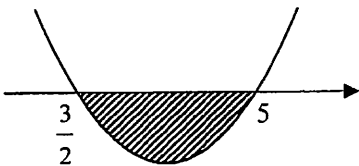
- 1.1 Mark all the answers.
- 1.2 Do not mark working / answer that has been cancelled.
- 1.3 Answer written in the answer space or at the end of the working is considered the final answer.
- 1.4 Full mark is given for the correct answer without referring to the working.
- 1.5 If the final answer is wrong, award the corresponding maximum mark as stated in the marking scheme.
- 1.6 If more than one final answer is given, choose the answer with the highest mark unless stated otherwise in the marking scheme.
- 1.7 If the final answer is correct, but stated wrongly in the answer space, full mark is not awarded.

**2. NOTATION**

- 2.1 Full mark for each question in this paper is either 2, 3 or 4.
  - 2.2 If full mark is not awarded, the following system is used :
    - B3** – 3 marks is awarded if the answer at this stage is correct.
    - B2** – 2 marks is awarded if the answer at this stage is correct.
    - B1** – 1 mark is awarded if the answer at this stage is correct.
  - 2.3 Only one out of B3, B2 or B1 is awarded for each question or part of a question.
3. Accept answers correct to 4 significant figures unless stated otherwise in the marking scheme.
  4. Accept other correct methods which are not given in the marking scheme.
  5. Accept answers in Bahasa Melayu.
  6. Calculating total marks.

$$\frac{\sum \text{Score for Paper 1} + \sum \text{Score for Paper 2}}{180} \times 100\%$$

**FINAL YEAR EXAM FORM 4 (2011)**  
**MARK SCHEME FOR ADDITIONAL MATHS. PAPER 1**

No.	Mark Scheme	Σ Mark
1	(a) 2, 3, 4 [1] ignore all types of brackets (b) many-to-one [1]	2
2	3 [2] -2 B1	2
3	(a) $4 - 2x$ [2] $2y = 4 - x$ <u>or</u> $2x = 4 - y$ <u>or</u> equivalent B1 (b) -2 [1]	3
4	$2x^2 - x - 9 = 0$ [2] $2x^2 - x - 9$ <u>or</u> $2x^2 + 2x - x - 1 = 8 + 2x$ <u>or</u> equivalent B1	2
5	$k = -1$ [3] $(-6)^2 - 4(k+2)(9) = 0$ B2 $(-6)^2 - 4(k+2)(9)$ B1	3
6	$\frac{3}{2} < x < 5$ [3]  B2 for the graph <u>and</u> the 2 values (including shaded region) $\frac{3}{2}, 5$ B1 (accept other methods such as line number, table etc and give the corresponding marks)	3

No.	Mark Scheme	$\Sigma$ Mark
7	$4x^2 - 3x - 4 = 0 \text{ or } x^2 - \frac{3}{4}x - 1 = 0 \quad [4]$ <p><math>\frac{3}{4}</math> and <math>-1</math>                      <b>B3 (both)</b></p> $\frac{2(a+b)}{ab} \text{ or } \frac{4}{ab} \quad \text{B2}$ $a + b = -\frac{3}{2} \text{ or } ab = -\frac{8}{2} \quad \text{B1}$ <p><b>OR</b></p> $4x^2 - 3x - 4 = 0 \text{ or } x^2 - \frac{3}{4}x - 1 = 0 \quad [4]$ <p><math>\frac{3}{4}</math> and <math>-1</math> (both)                      <b>B3</b></p> $x^2 - \left(\frac{2(a+b)}{ab}\right)x + \frac{4}{ab} = 0 \quad \text{B2}$ $\left(x - \frac{2}{a}\right)\left(x - \frac{2}{b}\right) = 0 \quad \text{and } a + b = -\frac{3}{2} \text{ or } ab = -\frac{8}{2} \quad \text{B1}$	4
8	<p>(a) <math>p = -2, q = -4</math> (both)                      [2]  <math>p = -2, q = -4</math> (either one)                      <b>B1</b></p> <p>(b) <math>(0, 8)</math>                      [2]  <math>y = 3[0 + *(-2)]^2 + (-4)</math>                      <b>B1</b></p>	4
9	$3^{3x-5}$ [3] $3x - 5$ <b>B2</b> $\frac{3^{2(x+1)}}{3^{2x-1}} \times \frac{3^{3(x-2)}}{3^2}$ <b>B1</b>	3
10	$5$ [3] $2^x = 32$ <b>or</b> $2^x = 2^5$ <b>B2</b> $\frac{2^x}{2^2}$ <b>or</b> equivalent <b>B1</b>	3

No.	Mark Scheme	Σ Mark
11	$-2$ [3] $1 + 3x = -5$ <u>or</u> equivalent <b>B2</b> $2^1 \times 2^{3x} = \frac{1}{2^5}$ <b>B1</b>	3
12	$1.262$ [3] $\frac{0.6021}{0.4771}$ <b>B2</b> $x \log 3 = \log 4$ <b>B1</b>	3
13	$16$ [3] $2p^2 = 8^3$ <b>B2</b> $\log_8 2p^2 = 3$ <b>B1</b> for $\log_8 2p^2$	3
14	$x = \frac{1}{2y^2}$ [4] $xy^2 = 2^{-1}$ <b>B3</b> $\log_2 xy^2$ <b>B2</b> $\frac{\log_2 y}{\log_2 4}$ <b>B1</b>	4
15	$3y = 2x - 9$ <u>or</u> equivalent [3] $y - (-1) = \frac{2}{3}(x - 3)$ <u>OR</u> $-1 = \frac{2}{3}(3) + c$ <b>B2</b> $m_{PQ} = \frac{2}{3}$ <b>B1</b>	3
16	$\theta = \frac{9}{5}$ <u>or</u> $1.8$ rad [3] $9 = 5\theta$ <b>B2</b> $r = 5$ cm <b>B1</b>	3

No.	Mark Scheme	$\Sigma$ Mark
7	$4x^2 - 3x - 4 = 0 \text{ or } x^2 - \frac{3}{4}x - 1 = 0 \quad [4]$ <p><math>\frac{3}{4}</math> and <math>-1</math>                      <b>B3 (both)</b></p> <p><math>\frac{2(a+b)}{ab}</math> or <math>\frac{4}{ab}</math>                      <b>B2</b></p> <p><math>a + b = -\frac{3}{2}</math> or <math>ab = -\frac{8}{2}</math>                      <b>B1</b></p> <p><b>OR</b></p> $4x^2 - 3x - 4 = 0 \text{ or } x^2 - \frac{3}{4}x - 1 = 0 \quad [4]$ <p><math>\frac{3}{4}</math> and <math>-1</math> (both)                      <b>B3</b></p> <p><math>x^2 - \left(\frac{2(a+b)}{ab}\right)x + \frac{4}{ab} = 0</math>                      <b>B2</b></p> <p><math>\left(x - \frac{2}{a}\right)\left(x - \frac{2}{b}\right) = 0</math> and <math>a + b = -\frac{3}{2}</math> or <math>ab = -\frac{8}{2}</math>                      <b>B1</b></p>	4
8	<p>(a) <math>p = -2, q = -4</math> (both)                      [2]</p> <p><math>p = -2, q = -4</math> (either one)                      <b>B1</b></p> <p>(b) <math>(0, 8)</math>                      [2]</p> <p><math>y = 3[0 + *(-2)]^2 + (-4)</math>                      <b>B1</b></p>	4
9	<p><math>3^{3x-5}</math>                      [3]</p> <p><math>3x - 5</math>                      <b>B2</b></p> <p><math>\frac{3^{2(x+1)}}{3^{2x-1}} \times \frac{3^{3(x-2)}}{3^2}</math>                      <b>B1</b></p>	3
10	<p>5                      [3]</p> <p><math>2^x = 32</math> or <math>2^x = 2^5</math>                      <b>B2</b></p> <p><math>\frac{2^x}{2^2}</math> or equivalent                      <b>B1</b></p>	3

SULIT

5

3472/1(PP)

No.	Mark Scheme	Σ Mark
11	$-2$ [3] $1 + 3x = -5$ <u>or</u> equivalent B2 $2^1 \times 2^{3x} = \frac{1}{2^5}$ B1	3
12	$1.262$ [3] $\frac{0.6021}{0.4771}$ B2 $x \log 3 = \log 4$ B1	3
13	$16$ [3] $2p^2 = 8^3$ B2 $\log_8 2p^2 = 3$ B1 for $\log_8 2p^2$	3
14	$x = \frac{1}{2y^2}$ [4] $xy^2 = 2^{-1}$ B3 $\log_2 xy^2$ B2 $\frac{\log_2 y}{\log_2 4}$ B1	4
15	$3y = 2x - 9$ <u>or</u> equivalent [3] $y - (-1) = \frac{2}{3}(x - 3)$ <u>OR</u> $-1 = \frac{2}{3}(3) + c$ B2 $m_{PQ} = \frac{2}{3}$ B1	3
16	$\theta = \frac{9}{5}$ <u>or</u> $1.8$ rad [3] $9 = 5\theta$ B2 $r = 5$ cm B1	3

SULIT

5

3472/1(PP)

No.	Mark Scheme	Σ Mark
11	$-2$ [3] $1 + 3x = -5$ <u>or</u> equivalent B2 $2^1 \times 2^{3x} = \frac{1}{2^5}$ B1	3
12	$1.262$ [3] $\frac{0.6021}{0.4771}$ B2 $x \log 3 = \log 4$ B1	3
13	$16$ [3] $2p^2 = 8^3$ B2 $\log_8 2p^2 = 3$ B1 for $\log_8 2p^2$	3
14	$x = \frac{1}{2y^2}$ [4] $xy^2 = 2^{-1}$ B3 $\log_2 xy^2$ B2 $\frac{\log_2 y}{\log_2 4}$ B1	4
15	$3y = 2x - 9$ <u>or</u> equivalent [3] $y - (-1) = \frac{2}{3}(x - 3)$ <u>OR</u> $-1 = \frac{2}{3}(3) + c$ B2 $m_{PQ} = \frac{2}{3}$ B1	3
16	$\theta = \frac{9}{5}$ <u>or</u> $1.8$ rad [3] $9 = 5\theta$ B2 $r = 5$ cm B1	3



No.	Mark Scheme	$\Sigma$ Mark
17	<p>(a) 0.6436 rad. [1]</p> <p>(b) 8.18 cm<sup>2</sup> [3]</p> <p><math>\frac{1}{2}(10)(10)(0.6436) - \frac{1}{2}(8)(6)</math> <u>or</u> <math>-\frac{1}{2}(8)(10) \sin 36.87^\circ</math> B2</p> <p><math>\frac{1}{2}(10)(10)(0.6436)</math> <u>or</u> <math>\frac{1}{2}(8)(6)</math> <u>or</u> <math>\frac{1}{2}(8)(10) \sin 36.87^\circ</math> B1</p>	4
18	<p><math>m = 3, 11</math> [3]</p> <p><math>5(6) + 3(-2) + m(2) - [3(2) + m(6) + 5(-2)] = 16</math></p> <p><u>or</u> <math>5(6) + 3(-2) + m(2) - [3(2) + m(6) + 5(-2)] = -16</math> B2</p> <p><math>\frac{1}{2}   5(6) + 3(-2) + m(2) - [3(2) + m(6) + 5(-2)]  </math> B1</p>	3
19	<p><math>h = 3, k = 8</math> (both) [3]</p> <p><math>h = 3</math> <u>or</u> <math>k = 8</math> B2</p> <p><math>\frac{3(2)+1(6)}{1+3} = h</math> <u>or</u> <math>\frac{3(0)+1(k)}{1+3} = 2</math> B1</p>	3
20	<p>10.89 [3]</p> <p><math>m = 9.5 + \left( \frac{\frac{1}{2}(40) - 15}{18} \right) \times 5</math> B2</p> <p>9.5 <u>or</u> 15 <u>or</u> 18 B1</p>	3
21	<p>(a) 20 [2]</p> <p><math>\bar{x} = \frac{240}{12}</math> B1</p> <p>(b) 5 [2]</p> <p><math>\sigma^2 = \frac{4860}{12} - 20^2</math> B1</p>	4

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**END OF MARK SCHEME**

No.	Mark Scheme	Σ Mark
22	(a) 10 $4+5+8+x+20 = 9.4$ B1 (b) 5.713 $\sqrt{\frac{605}{5} - (9 \cdot 4)^2}$ B1 [2]	4
23	$3(10x-1)(2x-1)^3$ [3] $\frac{dy}{dx} = 3x(4)(2x-1)^3(2) + (2x-1)^4(3)$ B2 $\frac{du}{dx} = 3$ OR $\frac{dv}{dx} = 4(2x-1)^3(2)$ B1	3
24	(a) 20 [2] $\frac{dy}{dx} = 9x^2 - 8x$ B1 (b) 0.4 [2] $20 * (0.02)$ B1	4
25	$6y = x + 11$ OR equivalent [4] $y - 2 = \frac{6}{1}(x - 1)$ OR $2 = \frac{6}{1}(1) + c$ B3 $\frac{dx}{dy} = 2 \left( \frac{1}{2} \right) (3x - 5)(3)$ and $m = \frac{6}{1}$ B2 $\frac{dx}{dy} = 2 \left( \frac{1}{2} \right) (3x - 5)(3)$ B1	4