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Mark Scheme (Results)
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GCE O Level

O Level Mathematics B (7361) Paper 1

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A PEARSON COMPANY

Mathematics B 7361

Paper 1

1.	(a)	0.0625		B1	1
	(b)	6.25%	(o.e.)	B1 ft	1
					2
					Total 2 marks

2.	an attempt at the bisector of $\angle RPQ$ drawn		M1	
	bisector of $\angle RPQ$ drawn $\pm$ 1mm (ie no daylight)		A1	
				2
				Total 2 marks

3.	$4x - \frac{x}{3} > 10 + 1$	(o.e.)	M1	
	$x > 3$		A1	
				2
				Total 2 marks

4.	(a)	75 mins		B1	1
	(b)	45 mins		B1	1
					2
					Total 2 marks

5.	(a)	0		B1	1
	(b)	2		B1	1
					2
					Total 2 marks

6.	$\frac{54}{A} = \frac{9^2}{4.5^2}$	(o.e.)	M1	
	13.5 cm^2		A1	
				2
				Total 2 marks

7. $4x + x = 180$ M1

36 A1

2

Total 2 marks

8. 11 and 29 clearly identified M1

40 A1

2

Total 2 marks

9. $w = 90^{o}$ B1

$a = -1$ B1

2

Total 2 marks

10. $\frac{?}{1000} \times 360 = 126$ M1

$? = \frac{126 \times 1000}{360}$ M1 dep

350 red cars A1

3

Total 3 marks

11. **Either:**

$3x - 4 = 3 - 2x$ M1

$3x + 2x = 3 + 4$ (isolating x) M1 dep

$x = \frac{7}{5}$ (o.e.) A1

3

or:

$(y + 4)/3 = (3 - y)/2$ (allow one slip)

$y = 1/5$

substituting c's(1/5) into either equation M1

isolating x M1

$x = \frac{7}{5}$ (o.e.) A1

Total 3 marks

12. (a) 9 km B1 1

(b) $\cos 50 = \frac{\text{c's(9)}}{\text{distance to mast}}$ (o.e.) M1

14.0 km A1 2 **3**

Alternatively:

PM/c's(9) = tan 50 (10.73...)

QM^2 = c's(9)^2 + c's(10.73)^2 M1

14.0 km A1

Total 3 marks

13. (a) correct line drawn B1

both end points correctly identified with appropriate symbols B1 2

(b) -1, 0 B1 1

3

Total 3 marks

14. (a) 234 B1 1

(b) $\frac{\Sigma \text{ of fish}}{11}$ (sum of 11 terms) M1

266 A1 2 **3**

Total 3 marks

15. **either:**

taking *x* out correctly as a factor
$x(3x^2 + 2x - 1)$ M1

attempt at factorising c's trinomial quadratic
$x\,(\,3x\,-\,1\,)\,(\,x\,+\,1\,)$ M1

$x\,(\,3x\,-\,1\,)\,(\,x\,+\,1\,)$ A1 **3**

or:

attempt at factorising c's trinomial cubic
$(3x^2\,-\,x)(\,x\,+\,1)$ (o.e.) M1

taking *x* out correctly from their factored form
$x(3x\,-\,1)(\,x\,+\,1)$ M1

$x\,(\,3x\,-\,1\,)\,(\,x\,+\,1\,)$ A1

Total 3 marks

16. $3x^2\,-\,2\,-\,\frac{1}{x^2}$ (at least2 terms correct) M1

$3\times 2^2\,-\,2\,-\,\frac{1}{2^2}$ (subs $x = 2$) M1 dep

9.75 (o.e.) A1

3

Total 3 marks

17. (a) 4, 10 B1 1

(b) 2 B1 1

(c) 9, 15 B1 1

3

Total 3 marks

18. $OA = OB = \sqrt{\frac{10^2}{2}}$ (7.1...) (o.e.) B1

either $\frac{90}{360}$ x π x c's(7.1..)^2 **or** $\frac{1}{2}$ x c's(7.1)^2 M1

difference between c's two areas M1 dep

14.3 cm^2 A1

4

Total 4 marks

19. 375 = $\frac{k}{2^2}$ M1

k = $2^2 \times 375$ (1500) (o.e.) M1 dep

c's(k) $\div 5^2$ (o.e.) M1 dep

60 A1

4

Total 4 marks

20. (a) one correctly identified pair of angles equal with reason B1

a second correctly identified pair of angles equal with reason and conclusion B1 2

e.g.

$\angle AED = \angle BEC$ vertically opposite $\angle$s,
$\angle DAC = \angle DBC$ $\angle$s in same segment

(b) $\frac{AE}{BE} = \frac{AD}{BC}$ M1

$AE \times BC = BE \times AD$ A1 2

4

Total 4 marks

21. Either:

removing denominators correctly
$(a - x)\,a\,y = a\,(x + ay) + a - x$ M1

expanding terms (one sign error allowed)
$a^2 y - axy = ax + a^2y + a - x$ M1

collecting terms (one sign error allowed)
$x - ax - axy = a$ (o.e.) M1

$x = \dfrac{a}{1 - a - ay}$ (o.e.) A1 **4**

or:

$\dfrac{x + ay}{a - x} = y - \dfrac{1}{a}$

expanding terms (one sign error allowed)
$x + ay = ay - xy - 1 + \dfrac{x}{a}$ M1

collecting terms (one sign error allowed)
$x + xy - \dfrac{x}{a} = -1$ M1

removing denominator correctly
$ax + axy - x = -a$ (o.e.) M1

$x = \dfrac{a}{1 - a - ay}$ (o.e.) A1

Total 4 marks

22. (a) **either:**

18 + n(B) - 7 = 27 (o.e.)

or:

n($B \cap (A \cup C)'$) = 5 (seen) M1

n(B) = 16 A1 2

(b) **either:**

n($A \cap B'$) = 11 and n($C \cap B'$) = 21 – c's(5)

or:

32 + 27 - c's(a) (o.e.) M1

43 A1 2

4

Total 4 marks

23. $\sqrt{20^2 - 12^2}$ (= 16) M1

$\pi \times 12^2 \times c's(16)$ or $\frac{1}{3} \times \pi \times 12^2 \times c's(16)$ M1

$\pi \times 12^2 \times$"16" - $\frac{1}{3} \times \pi \times 12^2 \times$"16" M1 dep

4830 ,4820 (using π = 3.14) A1

4

Total 4 marks

24. -10x^2 + 13x = -3 M1

10x^2 - 13x - 3 (= 0) A1

attempt at solving a trinomial quadratic
(2x - 3) (5x + 1) (= 0) M1

$\frac{3}{2}, \quad -\frac{1}{5}$ (o.e.) A1, A1

5

Total 5 marks

25.	(a)	12%	B1	1	
	(b)	**either:**			
		22	B1		
		(total weight =) 25 + 2x	B1		
		$\frac{\textit{any numerical value}}{25 + 2x} = \frac{2}{3}$	M1		
		4 kg	A1	4	**5**
		or:			
		33	B1		
		(total weight =) 25 + 2x	B1		
		25 + 2x = 33	M1		
		4 kg	A1		
					Total 5 marks
26.	(a)	$\lvert \boldsymbol{AB} \rvert = \sqrt{3^2 + 3^2}$	M1		
		k = 18	A1	2	
	(b)	Correct use of Pythag. on at least one side	M1		
		Correct Pythag. method to find all 3 sides	M1 dep		
		conclusion correctly obtained	A1	3	**5**
		Alternatively:			
		Gradient of OA = 1	M1		
		Gradient of AB = -1	M1 dep		
		Gradient of OA x gradient of AB = -1 So OA is perpendicular to AB	A1		**Total 5 marks**

27. correctly substituting

$\frac{3+x}{3-x}=\frac{x+4}{x-4}$ M1

removing the denominator

$(3 + x)(x - 4) = (x + 4)(3 - x)$ M1 dep

Expanding, allowing one slip max.

$x^2 - x - 12 = -x^2 - x + 12$ (o.e.) M1 dep

$2x^2 - 24 (= 0)$ A1

3.46, -3.46 (or equivalent surd form) A1, A1

6

Total 6 marks

28. (a) no gaps and class boundaries correct B1

1 correctly drawn height B1

2 correctly drawn heights B1

all correct B1 4

(0.9, 1.4, 2.3, 1.7 $\pm\frac{1}{2}$ small square)

(b) 10 x c's(0.9) + 10 x c's(1.4) (o.e.) M1

23 goals A1 2

6

Total 6 marks

29. (a) sin $\angle EAD = \frac{3}{10}$ (o.e.) M1

Alternatively:

Using Pythagoras and then
tan $\angle EAD$ = 3/√c's(91)

$\angle EAD$ = 17.5° A1 2

(b) *AD* = $\sqrt{10^2 - 3^2}$ (= 9.5394) M1

tan(20 + c's($\angle EAD$)) = $\frac{BD}{c's(AD)}$ M1 dep

BD = 7.30, 7.31, 7.32 A1 3

(c) $\Delta ABC = \frac{1}{2} \times (2 \times c's(AD)) \times c's(BD)$ (o.e.) M1

ΔABC = 69.5 → 69.8 cm^2 A1 2 **7**

Total 7 marks