High School
Mathematics Test 2013

Year

Algebraic Products

Non Calculator Section

Skills and Knowledge Assessed:

- Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate (ACMNA213)
- Expand binomial products and factorise monic quadratic expressions using a variety of strategies (ACMNA233)

Name_____

Section 1 Non Calculator Section

Write all working and answers in the spaces provided on this test paper.

1. Simplify $-3ac \times 9ab^2$.

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2. Simplify $6p^2r^4 \times 5p^2q$.

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3. Simplify $-30w^2x \div -6wx$.

……

4. Simplify $\dfrac{24a^3c^5}{-4a^2b^3c}$.

……

5. Expand $-5(2m-7)$.

……

6. Expand $6a(5a-4b)$.

……

7. Expand $2s^2t\left(8s+4t^2\right)$.

……

8. Expand and simplify $3(w-5)+6-5w$.

……

……

9. Expand and simplify $2(x - 3) + 2(3x + 4)$.

……

……

10. Expand and simplify $3m(2m - 7) + 3(5m - 6)$.

……

……

11. Expand and simplify $(c + 8)(c + 6)$.

……

……

12. Expand and simplify $(t - 7)(3t + 4)$.

……

……

13. Expand and simplify $(s - 9)(s - 6)$.

……

……

14. Expand and simplify $(a - 8b)(2a - 3b)$.

……

……

15. Expand and simplify $(3x - 2)(2x + 5)$.

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16. Expand and simplify $(5z - 6)(5z + 6)$.

……

……

17. Expand and simplify $(a-5)^2$

……

……

18. Expand and simplify $(4w-5)^2$.

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High School
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Calculator Allowed Section

Year

Name_____

Section 2 Multiple Choice Section

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. $12am \times 3pm$ = ?

   A. $15apm$ B. $15apm^2$ C. $36apm$ D. $36apm^2$

2. Which of these does not simplify to $15x^2y$?

   A. $3x^2 \times 5xy$ B. $5x \times 3xy$ C. $15x \times xy$ D. $45x^3y^2 \div 3xy$

3. $6(5x + 6)$ = ?

   A. $11x + 12$ B. $11x + 36$ C. $30x + 12$ D. $30x + 36$

4. $-7(z - 5)$ = ?

   A. $-7z - 12$ B. $-7z + 12$ C. $-7z + 35$ D. $-7z - 35$

5. Expand and simplify $3b - 2(b - 2c) - 4c$

   A. b B. $b - 8c$ C. $b + 8c$ D. $5b - 8c$

6. $(m + 3)(m + 7)$ = ?

   A. $2m^2 + 10$ B. $m^2 + 10m + 21$

   C. $m^2 + 10m + 10$ D. $m^2 + 21m + 10$

7. $(a + 9)(a - 4)$ = ?

   A. $2a^2 + 5$ B. $a^2 - 5a - 36$

   C. $a^2 + 5a - 36$ D. $a^2 + 5a + 36$

8. $(k-8)(k-6) = ?$

A. $-2k^2 - 14$ B. $k^2 - 14k + 48$

C. $a^2 + 5a - 36$ D. $a^2 + 5a + 36$

9. $(y-1)(y+1) = ?$

A. $y^2 - 1$ B. $y^2 + 1$

C. $y^2 - 2y + 1$ D. $y^2 - 2y - 1$

10. $(2p-7)(p+1) = ?$

A. $3p^2 - 6$ B. $2p^2 - 5p - 7$

C. $2p^2 + 5p - 7$ D. $2p^2 - 5p - 14$

11. $(2r-5)(3r-4) = ?$

A. $5r - 9$ B. $6r^2 - 7r + 20$

C. $6r^2 + 23r - 20$ D. $6r^2 - 23r + 20$

12. $(5t-3u)^2 = ?$

A. $10t^2 - 6u^2$ B. $25t^2 - 15ut + 9u^2$

C. $25t^2 - 30ut + 9u^2$ D. $25t^2 + 30ut - 9u^2$

High School
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Calculator Allowed Section

Name_____

Section 3 Longer Answer Section

Write all working and answers in the spaces provided on this test paper.

Marks

a) Expand and simplify the following

a) $(y-5)(y+5) + (y-3)(y+7)$. **2**

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……

……

b) $8(2x^2-3x+1) - (x-3)(x+4)$. **2**

……

……

……

c) $(x-7)(3x^2-4x+5)$ **2**

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……

High School
Mathematics Test 2013

Multiple Choice Answer Sheet

Name _____

Completely fill the response oval representing the most correct answer.

1.	A ⬭	B ⬭	C ⬭	D ⬭
2.	A ⬭	B ⬭	C ⬭	D ⬭
3.	A ⬭	B ⬭	C ⬭	D ⬭
4.	A ⬭	B ⬭	C ⬭	D ⬭
5.	A ⬭	B ⬭	C ⬭	D ⬭
6.	A ⬭	B ⬭	C ⬭	D ⬭
7.	A ⬭	B ⬭	C ⬭	D ⬭
8.	A ⬭	B ⬭	C ⬭	D ⬭
9.	A ⬭	B ⬭	C ⬭	D ⬭
10.	A ⬭	B ⬭	C ⬭	D ⬭
11.	A ⬭	B ⬭	C ⬭	D ⬭
12.	A ⬭	B ⬭	C ⬭	D ⬭

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ANSWERS

Section 1	
1.	$-3ac \times 9ab^2 = -27a^2b^2c$
2.	$6p^2r^4 \times 5p^2q = 30p^4qr^4$
3.	$-30w^2x \div -6wx = 5w$
4.	$\frac{24a^3c^5}{-4a^2b^3c} = -\frac{6ac^4}{b^3}$
5.	$-5(2m-7) = -10m + 35$
6.	$6a(5a-4b) = 30a^2 - 24ab$
7.	$2s^2t\left(8s + 4t^2\right) = 16s^3t + 8s^2t^3$
8.	$3(w-5) + 6 - 5w = 3w - 15 + 6 - 5w$ $= -2w - 9$
9.	$2(x-3) + 2(3x+4) = 2x - 6 + 6x + 8$ $= 8x + 2$
10.	$3m(2m-7) + 3(5m-6) = 6m^2 - 21m + 15m - 18$ $= 6m^2 - 6m - 18$
11.	$(c+8)(c+6) = c^2 + 6c + 8c + 48$ $= c^2 + 14c + 48$
12.	$(t-7)(3t+4) = 3t^2 + 4t - 21t - 28$ $= 3t^2 - 17t - 28$
13.	$(s-9)(s-6) = s^2 - 6s - 9s + 54$ $= s^2 - 15s + 54$
14.	$(a-8b)(2a-3b) = 2a^2 - 3ab - 16ab + 24b^2$ $= 2a^2 - 19ab + 24b^2$
15.	$(3x-2)(2x+5) = 6x^2 + 15x - 4x - 10$ $= 6x^2 + 11x - 10$
16.	$(5z-6)(5z+6) = 25z^2 - 36$
17.	$(a-5)^2 = a^2 - 10a + 25$
18.	$(4w-5)^2 = 16w^2 - 40w + 25$

Section 2	
1.	D
2.	A
3.	D
4.	C
5.	A
6.	B
7.	C
8.	B
9.	A
10.	B
11.	D
12.	C

Section 3		
1.	a) $(y-5)(y+5) + (y-3)(y+7) = y^2 - 25 + y^2 + 4y - 21$ $= 2y^2 + 4y - 46$	1 mark for expansions 1 for simplifying
	b) $8(2x^2 - 3x + 1) - (x-3)(x+4) = 16x^2 - 24x + 8 - (x^2 + x - 12)$ $= 16x^2 - 24x + 8 - x^2 - x + 12$ $= 15x^2 - 25x + 20$	1 mark for expansions 1 for simplifying
	c) $(x-7)(3x^2 - 4x + 5) = 3x^3 - 4x^2 + 5x - 21x^2 + 28x - 35$ $= 3x^3 - 25x^2 + 33x - 35$	1 mark for expansion 1 for simplifying

High School
Mathematics Test 2013

Multiple Choice Answer Sheet

Name Marking Sheet

Completely fill the response oval representing the most correct answer.

1.	A ○	B ○	C ○	D ●
2.	A ●	B ○	C ○	D ○
3.	A ○	B ○	C ○	D ●
4.	A ○	B ○	C ●	D ○
5.	A ●	B ○	C ○	D ○
6.	A ○	B ●	C ○	D ○
7.	A ○	B ○	C ●	D ○
8.	A ○	B ●	C ○	D ○
9.	A ●	B ○	C ○	D ○
10.	A ○	B ●	C ○	D ○
11.	A ○	B ○	C ○	D ●
12.	A ○	B ○	C ●	D ○