

# High School Mathematics Test 2014

Year 9

## Algebraic Products

Non Calculator

### Skills and Knowledge Assessed:

- Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate (ACMNA213)
- Apply the four operations to simple algebraic fractions with numerical denominators (ACMNA232)
- Expand binomial products and factorise monic quadratic expressions using a variety of strategies (ACMNA233)

Name \_\_\_\_\_

## Section 1 Short Answer Section

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

1. Simplify  $4pq \times 5p^2q$ .

.....

2. Simplify  $4r^2m \times 3r^2mn$ .

.....

3. Simplify  $-36d^2h \div 4dh$ .

.....

4. Simplify  $\frac{16a^2c}{-8ac}$ .

.....

5. Expand  $6(g - 5)$ .

.....

6. Expand  $2a(3a - 5b)$ .

.....

7. Expand and simplify  $4(p - 2) + 8 - 5p$ .

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8. Expand and simplify  $3(a - 3) + 3(3a + 4)$ .

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9. Expand and simplify  $3k(2k - 5) - 4(5k - 6)$ .

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.....

10. Simplify  $\frac{3m}{4} \times \frac{2m}{9}$ .

.....  
.....

11. Simplify  $\frac{2a}{5} \div \frac{6a}{15}$ .

.....  
.....

12. Simplify  $\frac{3m}{4} + \frac{5n}{6}$ .

.....  
.....

13. Expand and simplify  $(c + 4)(c + 7)$ .

.....  
.....

14. Expand and simplify  $(p - 5)(p + 8)$ .

.....  
.....

15. Expand and simplify  $(f - 8)(f - 6)$ .

.....  
.....

16. Expand and simplify  $(2a - 5)(3a - 4)$ .

.....  
.....

17. Expand and simplify  $(4x - 3)(5x + 4)$ .

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18. Expand and simplify  $(3z - 5)(3z + 5)$ .

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19. Expand and simplify  $(d - 7)^2$

.....

.....

20. Expand and simplify  $(3s - 4r)^2$ .

.....

.....

# High School Mathematics Test 2014

Year 9

## Algebraic Products

Calculator Allowed

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.	$8ad \times 3cd = ?$
	A. $11acd$ B. $24acd$ C. $24acd^2$ D. $24a^2c^2d^2$
2.	Which of these does not simplify to $18a^2b$ ?
	A. $3a \times 6ab$ B. $3a^2 \times 6b$ C. $18a^2 \times b$ D. $3ab \times 6ab$
3.	$6pr^2 \times 5p^2r = ?$
	A. $15p^3r^3$ B. $30p^3r^3$ C. $30p^2r^3$ D. $30p^3r^2$
4.	$5(4x + 7) = ?$
	A. $9x + 12$ B. $9x + 35$ C. $20x + 12$ D. $20x + 35$
5.	$-9(2z - 3) = ?$
	A. $-18z + 27$ B. $-18z - 27$ C. $18z + 27$ D. $18z - 27$
6.	Expand and simplify $4d - 2(d - 3e) - 8e$ .
	A. $-2d - 2e$ B. $2d - 2e$ C. $6d - 2e$ D. $6d - 14e$
7.	Expand and simplify $7x(x - 3y) + 11x^2 + 3xy$ .
	A. $4x^2 - 18xy$ B. $4x^2 - 24xy$ C. $18x^2 - 18xy$ D. $18x^2 + 18xy$
8.	Expand and simplify $6(p - 5k) - 5(p - 3k)$ .
	A. $p - 15k$ B. $p + 15k$ C. $11p + 15k$ D. $11p + 45k$
9.	$\frac{2pq}{3w} \times \frac{3w}{6p} = ?$
	A. $\frac{q}{3}$ B. $\frac{q}{2}$ C. $\frac{qw}{3}$ D. $\frac{pq}{3}$

10.	$\frac{6a}{5} \div \frac{3ab}{10} = ?$ A. $\frac{b}{4}$ B. $\frac{4}{b}$ C. $\frac{b}{4a}$ D. $\frac{4a}{b}$
11.	$(k+7)(k+9) = ?$ A. $k^2 + 63$ B. $k^2 + 2k + 63$ C. $k^2 + 2k + 16$ D. $k^2 + 16k + 63$
12.	$(x-1)(x+7) = ?$ A. $x^2 - 8x - 7$ B. $x^2 - 6x - 7$ C. $x^2 + 6x - 7$ D. $x^2 + 6x - 8$
13.	$(5k-7)(k-4) = ?$ A. $5k^2 - 13k - 11$ B. $5k^2 - 13k + 28$ C. $5k^2 - 27k - 11$ D. $5k^2 - 27k + 28$
14.	$(2r-5)(2r+5) = ?$ A. $4r^2 - 25$ B. $4r^2 - 20r - 25$ C. $4r^2 + 20r - 25$ D. $4r^2 + 20r + 25$
15.	$(4k-3p)^2 = ?$ A. $16k^2 - 9p^2$ B. $16k^2 - 24kp - 9p^2$ C. $16k^2 - 24kp + 9p^2$ D. $16k^2 + 24kp - 9p^2$

# *High School Mathematics Test 2014*

## Algebraic Products

### Multiple Choice Answer Sheet

Name \_\_\_\_\_

Completely fill the response oval representing the most correct answer.

- |     |   |                       |   |                       |   |                       |   |                       |
|-----|---|-----------------------|---|-----------------------|---|-----------------------|---|-----------------------|
| 1.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 2.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 3.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 4.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 5.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 6.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 7.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 8.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 9.  | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 10. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 11. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 12. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 13. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 14. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |
| 15. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |

# High School Mathematics Test 2014

## Algebraic Products

### ANSWERS

Section 1 ( 1 mark each)	
	Working and Answers
1.	$4pq \times 5p^2q = 20p^3q^2$
2.	$4r^2m \times 3r^2mn = 12r^4m^2n$
3.	$-36d^2h \div 4dh = -9d$
4.	$\frac{16a^2c}{-8ac} = -2a$
5.	$6(g-5) = 6g-30$
6.	$2a(3a-5b) = 6a^2-10ab$
7.	$4(p-2)+8-5p = 4p-8+8-5p$ $= -p$
8.	$3(a-3)+3(3a+4) = 3a-9+9a+12$ $= 12a+3$
9.	$3k(2k-5)-4(5k-6) = 6k^2-15k-20k+24$ $= 6k^2-35k+24$
10.	$\frac{3m}{4} \times \frac{2n}{9} = \frac{6mn}{36} = \frac{mn}{6}$
11.	$\frac{2a}{5} \div \frac{6a}{15} = \frac{2a}{5} \times \frac{15}{6a}$ $= \frac{30a}{30a} = 1$
12.	$\frac{3m}{4} + \frac{5m}{6} = \frac{9m}{12} + \frac{10m}{12}$ $= \frac{19m}{12}$
13.	$(c+4)(c+7) = c^2+7c+4c+28$ $= c^2+11c+28$
14.	$(p-5)(p+8) = p^2+8p-5p-40$ $= p^2+3p-40$
15.	$(f-8)(f-6) = f^2-6f-8f+48$ $= f^2-14f+48$
16.	$(2a-5)(3a-4) = 6a^2-8a-15a+20$ $= 6a^2-23a+20$
17.	$(4x-3)(5x+4) = 20x^2+16x-15x-12$ $= 20x^2+x-12$
18.	$(3z-5)(3z+5) = 9z^2-25$
19.	$(d-7)^2 = d^2-14d+49$
20.	$(3s-4r)^2 = 9s^2-2 \times 3s \times 4r+16r^2$ $= 9s^2-24rs+16r^2$

Section 2 (1 mark each)		
	Working	Answers
1.	$8ad \times 3cd = 24acd^2$	C
2.	$3ab \times 6ab = 18a^2b^2$	A
3.	$6pr^2 \times 5p^2r = 30p^3r^3$	B
4.	$5(4x + 7) = 20x + 35$	D
5.	$-9(2z - 3) = -18z + 27$	A
6.	$4d - 2(d - 3e) - 8e = 4d - 2d + 6e - 8e$ $= 2d - 2e$	B
7.	$7x(x - 3y) + 11x^2 + 3xy = 7x^2 - 21xy + 11x^2 + 3xy$ $= 18x^2 - 18xy$	C
8.	$6(p - 5k) - 5(p - 3k) = 6p - 30k - 5p + 15k$ $= p - 15k$	A
9.	$\frac{2pq}{3w} \times \frac{3w}{6p} = \frac{6pqw}{18pw}$ $= \frac{q}{3}$	A
10.	$\frac{6a}{5} \div \frac{3ab}{10} = \frac{6a}{5} \times \frac{10}{3ab}$ $= \frac{60a}{15ab}$ $= \frac{4}{b}$	B
11.	$(k + 7)(k + 9) = k^2 + 7k + 9k + 63$ $= k^2 + 16k + 63$	D
12.	$(x - 1)(x + 7) = x^2 + 7x - x - 7$ $= x^2 + 6x - 7$	C
13.	$(5k - 7)(k - 4) = 5k^2 - 20k - 7k + 28$ $= 5k^2 - 27k + 28$	D
14.	$(2r - 5)(2r + 5) = 4r^2 + 10r - 10r - 25$ $= 4r^2 - 25$	A
15.	$(4k - 3p)^2 = 16k^2 - 2 \times 12kp + 9p^2$ $= 16k^2 - 24kp + 9p^2$	C



# High School Mathematics Test 2014

## Algebraic Products

### Multiple Choice Answer Sheet

Name Marking Sheet

Completely fill the response oval representing the most correct answer.

- |     |   |                                  |   |                                  |   |                                  |   |                                  |
|-----|---|----------------------------------|---|----------------------------------|---|----------------------------------|---|----------------------------------|
| 1.  | A | <input type="radio"/>            | B | <input type="radio"/>            | C | <input checked="" type="radio"/> | D | <input type="radio"/>            |
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| 3.  | A | <input type="radio"/>            | B | <input checked="" type="radio"/> | C | <input type="radio"/>            | D | <input type="radio"/>            |
| 4.  | A | <input type="radio"/>            | B | <input type="radio"/>            | C | <input type="radio"/>            | D | <input checked="" type="radio"/> |
| 5.  | A | <input checked="" type="radio"/> | B | <input type="radio"/>            | C | <input type="radio"/>            | D | <input type="radio"/>            |
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