High School Mathematics Test 2015

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 $3m^2 \times 7mn$.

   .....

2. Simplify $8qm^2 \times 2q^2m^2$.

   .....

3. Simplify $-48s^2t \div 8st$.

   .....

4. Simplify $\dfrac{21y^2z^3}{-3xy^2}$.

   .....

5. Expand $9(2p-9)$.

   .....

6. Expand $8c(3b-5c)$.

   .....

7. Expand and simplify $p(p-2)+6p-5p^2$.

   .....

   .....

8. Expand and simplify $5(r-7)+2(4r+1)$.

……

……

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

……

……

10. Simplify $\frac{2b}{5} \times \frac{4b}{7}$.

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11. Simplify $\frac{6c^2}{5d^2} \div \frac{3c}{10d}$.

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12. Simplify $\frac{6k}{5} + \frac{3k}{10}$.

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……

13. Expand and simplify $(p+9)(p+7)$.

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14. Expand and simplify $(w-6)(w+7)$.

……

……

15. Expand and simplify $(q+9)(q-9)$.

……

……

16.	Expand and simplify $(a - 5)(4a + 1)$. …… ……
17.	Expand and simplify $(3p - 2)(5p + 2)$. …… ……
18.	Expand and simplify $(4z - 1)(4z + 1)$. …… ……
19.	Expand and simplify $(2e - 9)^2$ …… ……
20.	Expand and simplify $(6s - r)(3r + 2s)$. …… ……

High School Mathematics Test 2015

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. $5pq \times 4pr = ?$

   A. $9p^2qr$ B. $20pqr$ C. $20p^2qr$ D. $20pqr^2$

2. Which of these does **not** simplify to $24xy^2z$?

   A. $2xy^2 \times 12z$ B. $4y^2 \times 6xz$ C. $8xy \times 3yz$ D. $24xy \times xyz$

3. $9w^2r^3 \times 8w^2r = ?$

   A. $17w^4r^3$ B. $17w^4r^4$ C. $72w^4r^3$ D. $72w^4r^4$

4. $9(7y - 5) = ?$

   A. $63y - 5$ B. $63y - 45$ C. $63y + 45$ D. $108y$

5. $-5(8f - 7) = ?$

   A. $-40f - 35$ B. $-40f + 35$ C. $40f - 35$ D. $40f + 35$

6. Expand and simplify $3a^2 + 4ab - 3a(a - 3b)$.

   A. $-6a^2 + 5ab$ B. $-6a^2 + 13ab$ C. $13ab$ D. $6a^2 + 5ab$

7. Expand and simplify $4d(e-3d)+11d^2+7ed$.

A. $11ed-d^2$ B. $11ed+d^2$ C. $11ed-23d^2$ D. $11ed+23d^2$

8. Expand and simplify $g(2g-3h)-3g(h-4g)$.

A. $14g^2-6gh$ B. $14g^2+6gh$ C. $14g^2$ D. $10g^2+6gh$

9. $\frac{12xy}{5z}\times\frac{3xz}{4yz}=?$

A. $\frac{9x^2}{5z}$ B. $\frac{9x^2}{5zy}$ C. $\frac{9yx^2}{5z}$ D. $\frac{9x^2}{5z^2}$

10. $\frac{12ws}{5}\div\frac{4w}{15s}=?$

A. $\frac{9s^2}{w^2}$ B. $9s^2$ C. $9s^2w$ D. $9s^2w^2$

11. $(e+8)(e+7)=?$

A. e^2+56 B. $e^2+8e+56$
C. $e^2+15e+15$ D. $e^2+15e+56$

12. $(u+9)(u-6)=?$

A. $u^2-15u-54$ B. $u^2+15u-54$
C. $u^2-3u-54$ D. $u^2+3u-54$

13. $(2k-9)(k-6)=?$

A. $2k^2-21k-54$ B. $2k^2-21k+54$
C. $2k^2-3k+54$ D. $2k^2+3k-54$

14. $(4d-1)(3d+4) = ?$

A. $12d^2 + 13d - 4$
B. $12d^2 + 19d - 4$
C. $12d^2 + 13d + 4$
D. $12d^2 + 19d + 4$

15. $(3r-2s)(3r+2s) = ?$

A. $9r^2 - 12rs - 4s^2$
B. $9r^2 + 4s^2$
C. $9r^2 - 4s^2$
D. $9r^2 + 12rs - 4s^2$

16. $(5a-4b)^2 = ?$

A. $25a^2 - 16b^2$
B. $25a^2 + 16b^2$
C. $25a^2 - 40ab + 16b^2$
D. $25a^2 + 40ab + 16b^2$

High School
Mathematics Test 2015

Multiple Choice Answer Sheet

Algebraic Products

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 ⬭
13.	A ⬭	B ⬭	C ⬭	D ⬭
14.	A ⬭	B ⬭	C ⬭	D ⬭
15.	A ⬭	B ⬭	C ⬭	D ⬭
16.	A ⬭	B ⬭	C ⬭	D ⬭

High School Mathematics Test 2015

Year 9 — **Algebraic Products** — Non Calculator

Section 1 Short Answer Section

ANSWERS

No.	WORKING	ANSWER
1.	$3m^2 \times 7mn = 21m^3n$	$21m^3n$
2.	$8qm^2 \times 2q^2m^2 = 16q^3m^4$	$16q^3m^4$
3.	$-48s^2t \div 8st = -6s$	$-6s$
4.	$\frac{21y^2z^3}{-3xy^2} = -\frac{7z^3}{x}$	$-\frac{7z^3}{x}$
5.	$9(2p-9) = 18p-81$	$18p-81$
6.	$8c(3b-5c) = 24bc-40c^2$	$24bc-40c^2$
7.	$p(p-2)+6p-5p^2 = p^2-2p+6p-5p^2$ $= 4p-4p^2$	$4p-4p^2$
8.	$5(r-7)+2(4r+1) = 5r-35+8r+2$ $= 13r-33.$	$13r-33$
9.	$4b(2b-3e)-3b(5b-e) = 8b^2-12eb-15b^2+3eb$ $= -7b^2-9eb$	$-7b^2-9eb$
10.	$\frac{2b}{5} \times \frac{4b}{7} = \frac{8b^2}{35}$	$\frac{8b^2}{35}$

11.	$\frac{6c^2}{5d^2} \div \frac{3c}{10d} = \frac{6c^2}{5d^2} \times \frac{10d}{3c}$ $= \frac{60c^2d}{15d^2c}$ $= \frac{4c}{d}$	$\frac{4c}{d}$
12.	$\frac{6k}{5} + \frac{3k}{10} = \frac{12k}{10} + \frac{3k}{10}$ $= \frac{15k}{10}$ $= \frac{3k}{2}$	$\frac{3k}{2}$
13.	$(p + 9)(p + 7) = p^2 + 16k + 63$	$p^2 + 16k + 63$
14.	$(w - 6)(w + 7) = w^2 + w - 42$	$w^2 + w - 42$
15.	$(q + 9)(q - 9) = q^2 - 81$	$q^2 - 81$
16.	$(a - 5)(4a + 1) = 4a^2 + a - 20a - 5$ $= 4a^2 - 19a - 5$	$4a^2 - 19a - 5$
17.	$(3p - 2)(5p + 2) = 15p^2 + 6p - 10p - 4$ $= 15p^2 - 4p - 4$	$15p^2 - 4p - 4$
18.	$(4z - 1)(4z + 1) = 16z^2 - 1$	$16z^2 - 1$
19.	$(2e - 9)^2 = 4e^2 - 2 \times 18e + 81$ $= 4e^2 - 36e + 81$	$4e^2 - 36e + 81$
20.	$(6s - r)(3r + 2s) = 18rs + 12s^2 - 3r^2 - 2rs$ $= 12s^2 + 16rs - 3r^2$	$12s^2 + 16rs - 3r^2$

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Mathematics Test 2015

Year 9 **Algebraic Products** Calculator Allowed

Section 2 Multiple Choice Section

ANSWERS

No.	WORKING	ANSWER
1.	$5pq \times 4pr = 20p^2qr$	**C**
2.	$24xy^2z$ $2xy^2 \times 12z = 24xy^2z$ $4y^2 \times 6xz = 24xy^2z$ $8xy \times 3yz = 24xy^2z$ $24xy \times xyz = 24x^2y^2z \neq 24xy^2z$	**D**
3.	$9w^2r^3 \times 8w^2r = 72w^4r^4$	**D**
4.	$9(7y-5) = 63y-45$	**B**
5.	$-5(8f-7) = -40f+35$	**B**
6.	$3a^2+4ab-3a(a-3b) = 3a^2+4ab-3a^2+9ab$ $= 13ab$	**C**
7.	$4d(e-3d)+11d^2+7ed = 4ed-12d^2+11d^2+7ed$ $= 11ed-d^2$	**A**
8.	$g(2g-3h)-3g(h-4g) = 2g^2-3gh-3gh+12g^2$ $= 14g^2-6gh$	**A**

9.	$\frac{12xy}{5z} \times \frac{3xz}{4yz} = \frac{36x^2yz}{20yz^2}$ $= \frac{9x^2}{5z}$	**A**
10.	$\frac{12ws}{5} \div \frac{4w}{15s} = \frac{12ws}{5} \times \frac{15s}{4w}$ $= 3s \times 3s$ $= 9s^2$	**B**
11.	$(e+8)(e+7) = e^2 + 15e + 56$	**D**
12.	$(u+9)(u-6) = u^2 + 3u - 54$	**D**
13.	$(2k-9)(k-6) = 2k^2 - 12k - 9k + 54$ $= 2k^2 - 21k + 54$	**B**
14.	$(4d-1)(3d+4) = 12d^2 + 16d - 3d - 4$ $= 12d^2 + 13d - 4$	**A**
15.	$(3r-2s)(3r+2s) = 9r^2 - 4s^2$	**C**
16.	$(5a-4b)^2 = 25a^2 - 2 \times 20ab + 16b^2$ $= 25a^2 - 40ab + 16b^2$	**C**

Multiple Choice Answer Sheet

Algebraic Products

Name _____ANSWERS_____

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 ●
13.	A ○	B ●	C ○	D ○
14.	A ●	B ○	C ○	D ○
15.	A ○	B ○	C ●	D ○
16.	A ○	B ○	C ●	D ○