School Name
Mathematics Test 2017

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 $3ab \times 4b$.

.....

2. Simplify $5s^2t \times 3st$.

.....

3. Simplify $-63y^2z^2 \div 9y$.

.....

4. Simplify $\dfrac{32w^3u^3}{-8uw^2}$.

.....

5. Expand $5(3d-4)$.

.....

6. Expand $5p(2q-3p)$.

.....

7. Expand and simplify $a(a+7)-a+3a^2$.

.....

.....

8. Expand and simplify $3(t-4)-2(4t-9)$.

……

……

9. Expand and simplify $6e(3e-2g)+5g(4e-g)$.

……

……

10. Simplify $\frac{4w}{7}\times\frac{3w}{5}$.

……

……

11. Simplify $\frac{16m}{9s^2}\div\frac{5s}{12m}$.

……

……

12. Simplify $\frac{4g}{3}+\frac{2g}{5}$.

……

……

13. Expand and simplify $(r+5)(r+8)$.

……

……

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

……

……

15. Expand and simplify $(x + 9)(x - 12)$.

……

……

16. Expand and simplify $(2b - 3)(b + 3)$.

……

……

17. Expand and simplify $(5d - 3)(2d + 4)$.

……

……

18. Expand and simplify $(3g - 2h)(3g + 2h)$.

……

……

19. Expand and simplify $(5s - 7)^2$.

……

……

20. Expand and simplify $(5p - 2q)(2q + 7p)$.

……

……

School Name
Mathematics Test 2017

Calculator Allowed

Year 9

Algebraic Products

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. $3mq \times 6mr = ?$

A. $9mqr$ B. $9m^2qr$ C. $18mqr$ D. $18m^2qr$

2. Which of these does **not** simplify to $30p^2r^2$?

A. $5p^2r \times 6r$ B. $3pr \times 10pr$ C. $2p^2 \times 15r$ D. $r^2 \times 30p^2$

3. $6w^2b^2 \times 4w^3b^2 = ?$

A. $10w^5b^4$ B. $24w^5b^4$ C. $64w^5b^4$ D. $64w^6b^4$

4. $\frac{28p^6q^4}{14p^3q^2} = ?$

A. $2p^2q^2$ B. $2p^3q^2$ C. $14p^2q^2$ D. $14p^3q^2$

5. $5(3a-1) = ?$

A. $15a-5$ B. $8a-5$ C. $5a^2-1$ D. $5a^2-5$

6. $-2a(3b-5) = ?$

A. $-6b-10a$ B. $-6b-10a$ C. $-6ab+10a$ D. $-6ab-10a$

7. Expand and simplify $20mn+12m^2-6m(m-3n)$.

A. $2mn+6m^2$ B. $2mn+18m^2$ C. $38mn-6m^2$ D. $38mn+6m^2$

8. Expand and simplify $\dfrac{12s(s-5)}{4(s-5)}$.

A. $3s$ B. $3s-15$ C. $3s^2$ D. $3s^2-5$

9. Expand and simplify $p(2p-5q)-3q(q-p)$.

A. $2p^2-2pq+3q^2$ B. $2p^2-2pq-3q^2$

C. $2p^2+8pq+3q^2$ D. $2p^2+8pq-3q^2$

10. $\dfrac{15ef}{4g}\times\dfrac{20e^2g}{3f}=?$

A. $25e^3$ B. $20e^3$ C. $\dfrac{20e^2}{g}$ D. $\dfrac{25e^2}{g}$

11. $\dfrac{24g^3h}{5m}\div\dfrac{14gh^2}{15m^2}=?$

A. $\dfrac{12g}{21m}$ B. $\dfrac{12g^2}{21hm}$ C. $\dfrac{18gm}{14h}$ D. $\dfrac{36g^2m}{7h}$

12. $(p+4)(p+11)=?$

A. $p^2+7p+44$ B. $p^2+44p+15$

C. $p^2+15p+44$ D. $p^2+7p+15$

13. $(s-7)(s+8) = ?$

A. $s^2 - s - 56$ B. $s^2 + s - 56$

C. $s^2 - 15s - 56$ D. $s^2 + 15s - 56$

14. $(3r-7)(r-2) = ?$

A. $3r^2 - 8r + 14$ B. $3r^2 - 13r - 14$

C. $3r^2 - 8r - 14$ D. $3r^2 - 13r + 14$

15. $(6d-5)(2d-3) = ?$

A. $12d^2 - 8d + 15$ B. $12d^2 - 8d - 15$

C. $12d^2 - 28d - 15$ D. $12d^2 - 28d + 15$

16. $(7r-3w)^2 = ?$

A. $49r^2 - 9w^2$ B. $49r^2 + 9w^2$

C. $49r^2 - 42rw + 9w^2$ D. $49r^2 + 42rw - 9w^2$

17. $(4c+11)(4c-11) = ?$

A. $16c^2 - 121$ B. $16c^2 + 121$

C. $16c^2 - 88c - 121$ D. $16c^2 + 88c - 121$

18. $(a-2b)(a+3b-4) = ?$

A. $a^2 + ab - 4a - 6b^2 + 8b$ B. $a^2 + 5ab - 4a - 6b^2 + 8b$

C. $a^2 + ab - 4a - 14b^2$ D. $ab - 5a^2 - 6b^2 + 8b$

School Name

Mathematics 2017

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 ⬭
17.	A ⬭	B ⬭	C ⬭	D ⬭
18.	A ⬭	B ⬭	C ⬭	D ⬭

School Name
Mathematics Test 2017

Year 9 — *Algebraic Products* — Non Calculator Section

ANSWERS

Question	Working and Answer
1.	$3ab \times 4b = 12ab^2$
2.	$5s^2t \times 3st = 15s^3t^2$
3.	$-63y^2z^2 \div 9y = -7yz^2$
4.	$\frac{32w^3u^3}{-8uw^2} = -4wu^2$
5.	$5(3d-4) = 15d-20$
6.	$5p(2q-3p) = 10pq - 15p^2$
7.	$a(a+7)-a+3a^2 = a^2+7a-a+3a^2$ $= 4a^2+6a$
8.	$3(t-4)-2(4t-9) = 3t-12-8t+18$ $= 6-5t$
9.	$6e(3e-2g)+5g(4e-g) = 18e^2-12eg+20eg-5g^2$ $= 18e^2+8eg-5g^2$
10.	$\frac{4w}{7} \times \frac{3w}{5} = \frac{12w^2}{35}$
11.	$\frac{16m}{9s^2} \div \frac{5s}{12m} = \frac{16m}{3\cancel{9}s^2} \times \frac{4\cancel{12}m}{5s}$ $= \frac{64m^2}{15s^3}$

Question	Working and Answer
12.	$\frac{4g}{3}+\frac{2g}{5}=\frac{20g}{15}+\frac{6g}{15}$ $=\frac{26g}{15}$
13.	$(r+5)(r+8)=r^2+8r+5r+40$ $=r^2+13r+40$
14.	$(w-7)(w-6)=w^2-6w-7w+42$ $=w^2-13w+42$
15.	$(x+9)(x-12)=x^2-12z+9x-108$ $=x^2-3x-108$
16.	$(2b-3)(b+3)=2b^2+6b-3b-9$ $=2b^2+3b-9$
17.	$(5d-3)(2d+4)=10d^2+20d-6d-12$ $=10d^2+14d-12$
18.	$(3g-2h)(3g+2h)=9g^2+6gh-6gh-4h^2$ $=9g^2-4h^2$
19.	$(5s-7)^2=(5s)^2-2\times 5s\times 7+(-7)^2$ $=25s^2-70s+49$
20.	$(5p-2q)(2q+7p)=10pq+35p^2-4q^2-14pq$ $=35p^2-4pq-4q^2$

School Name
Mathematics Test 2017

Year 9

Algebraic Products

Calculator Allowed
Multiple Choice
Section

ANSWERS

Question	Working	M C Answer
1.	$3mq \times 6mr = 18m^2qr$	**D**
2.	$2p^2 \times 15r = 30p^2r \neq 30p^2r^2$	**C**
3.	$6w^2b^2 \times 4w^3b^2 = 24w^5b^4$	**B**
4.	$\frac{28p^6q^4}{14p^3q^2} = 2p^3q^2$	**B**
5.	$5(3a-1) = 15a-5$	**A**
6.	$-2a(3b-5) = -6ab+10a$	**C**
7.	$20mn + 12m^2 - 6m(m-3n) = 20mn + 12m^2 - 6m^2 + 18mn$ $= 38mn + 6m^2$	**D**
8.	$\frac{3\,12\,s(s-5)}{4\,(s-5)} = 3s$	**A**
9.	$p(2p-5q) - 3q(q-p) = 2p^2 - 5pq - 3q^2 + 3pq$ $= 2p^2 - 2pq - 3q^2$	**B**
10.	$\frac{5\,15\,e}{4\,8} \times \frac{5\,20e^2\,8}{3} = 25e^3$	**A**

11.	$\frac{24g^3h}{5m} \div \frac{14gh^2}{15m^2} = \frac{12\,\cancel{24}\,\cancel{g^3}\,g^2\,\cancel{h}}{\cancel{5}\,\cancel{m}} \times \frac{3\,\cancel{15}\,\cancel{m^2}}{7\,\cancel{14}\,\cancel{g}\,\cancel{h^2}}$ $= \frac{36g^2m}{7h}$	**D**
12.	$(p+4)(p+11) = p^2 + 11p + 4p + 44$ $= p^2 + 15p + 44$	**C**
13.	$(s-7)(s+8) = s^2 + 8s - 7s - 56$ $= s^2 + s - 56$	**B**
14.	$(3r-7)(r-2) = 3r^2 - 6r - 7r + 14$ $= 3r^2 - 13r + 14$	**D**
15.	$(6d-5)(2d-3) = 12d^2 - 18d - 10d + 15$ $= 12d^2 - 28d + 15$	**D**
16.	$(7r-3w)^2 = 49r^2 - 2 \times 7r \times 3w + 9w^2$ $= 49r^2 - 42rw + 9w^2$	**C**
17.	$(4c+11)(4c-11) = 16c^2 - 44c + 44c - 121$ $= 16c^2 - 121$	**A**
18.	$(a-2b)(a+3b-4) = a(a+3b-4) - 2b(a+3b-4)$ $= a^2 + 3ab - 4a - 2ab - 6b^2 + 8b$ $= a^2 + ab - 4a - 6b^2 + 8b$.	**A**

School Name

Mathematics 2017

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 ○
17.	A ●	B ○	C ○	D ○
18.	A ●	B ○	C ○	D ○