High School
Mathematics Test 2013

Year
9

Basic Algebra Skills

Skills and Knowledge Assessed:
- Simplify algebraic expressions involving the four operations (ACMNA192)
- Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)
- Factorise algebraic expressions by identifying numerical factors (ACMNA191)

Name_____

Section 1   Short Answer Section

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

1.   Simplify $8p \times -5qr$.

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2.   Simplify $-7df \times 3dg$.

    ....

3.   Simplify $8a + 3 - 5a - 9$.

    ....

4.   Simplify $2z^2 - 4xz - 8z^2 - 7xz$.

    ....

5.   Simplify $-\dfrac{12df}{3d}$.

    ....

6.   Simplify $\dfrac{35w^2 t}{-5w}$.

    ....

7.   Given that $a = 5$, $b = -2$ and $c = 10$, find the value of $2ab + c$.

    ....

8.   Given that $x = 2$, $y = -4$ and $z = -6$, find the value of $\dfrac{3x^2 y}{z}$.

    ....

9.   Simplify completely $3a \times 4b - 6 \times a + 5ab - a$.

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10.   Simplify $-3x^2y \times 2xy$.

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11.   Expand $5(2x + 7)$.

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12.   Expand $6a\,(3b - 5a)$.

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13.   Expand and simplify $7m - 9 + 4(m - 6)$.

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14.   Expand and simplify $2s(s - 4) - 5(s + 7)$.

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15.   Simplify $\dfrac{4w^2z \times 5yz}{10wy}$.

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16.   Simplify $\dfrac{3xr}{5s^2} \times \dfrac{10s}{18x^2}$.

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17.   Factorise $18x^2 - 12x$.

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18.   Factorise $-15x^2y - 25x^2y^2$.

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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. Which expression below does not simplify to $6x^2y$?

 A. $3x \times 2xy$ B. $\dfrac{12x^2y^2}{2y}$ C. $4x^2y + 2x^2y$ D. $8x^2y - 2xy$

2. $3mn + 2m - 8mn + 8m =$

 A. $-5mn + 6m$ B. $-5mn + 10m$ C. $5mn + 6m$ D. $5mn + 10m$

3. When $x = -2$, $8x^2 - 4x =$

 A. -40 B. -24 C. 24 D. 40

4. If $m = -18$, $b = -6$ and $c = -3$, then $\dfrac{m}{bc} =$

 A. -2 B. -1 C. 1 D. 2

5. $3x(x + 5y) =$

 A. $3x^2 + 15xy$ B. $3x^2 + 15y$ C. $3x + 15xy$ D. $3x + 5xy$

6. Which of the following is **not** a factor of $28a^2b - 4ab^2$?

 A. $2b$ B. $4a$ C. $4ab^2$ D. $7a - b$

7. When $8m^2 - 16mn$ is fully factorised, the result is:

 A. $2\left(4m^2 - 8mn\right)$ B. $4m(2m - 4n)$ C. $8m(m - 2n)$ D. $8m^2(1 - 2n)$

8.

Using the formula $s = ut + \dfrac{at^2}{2}$ to find the value of s when $u = 12$, $a = -4$ and $t = 3$.

    A. -54 B.   18   C.   36   D.   54

9. $\dfrac{24x^2y}{3xy^2} =$

    A. $8xy$ B. $\dfrac{8}{xy}$ C. $\dfrac{8x}{y}$ D. $8x^3y^2$

10. $\dfrac{2m}{3} \times \dfrac{9m}{4n} =$

    A. $6m^2n$ B. $\dfrac{3m}{2n}$ C. $\dfrac{3}{2m^2n}$ D. $\dfrac{3m^2}{2n}$

11.   Which algebraic expression below represents :
"Half the sum of m and n."

    A. $\dfrac{m+n}{2}$ B. $\dfrac{m}{2} + n$ C. $m + \dfrac{n}{2}$ D. $\dfrac{1}{2}m + n$

12.   Which of the following means the same as $2(x + y)^2$?

    A.   Twice the square of the sum of x and y.
    B.   The square of twice the sum of x and y.
    C.   The sum of twice the square of x and y.
    D.   Twice the sum of the square of x and y.

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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 ◯

High School Mathematics Test 2013
Basic Algebra Skills

ANSWERS

Section 1
1. $8p \times -5qr = -40pqr$
2. $-7df \times 3dg = -21d^2fg$
3. $8a + 3 - 5a - 9 = 3a - 6$
4. $2z^2 - 4xz - 8z^2 - 7xz = -6z^2 - 11xz$
5. $-\dfrac{12df}{3d} = -4f$
6. $\dfrac{35w^2t}{-5w} = -7wt$
7. $2ab + c = 2 \times 5 \times (-2) + 10 = -20 + 10 = -10$
8. $\dfrac{3x^2y}{z} = \dfrac{3 \times 2^2 \times (-4)}{-6}$ $\qquad = \dfrac{-48}{-6}$ $\qquad = 8$
9. $3a \times 4b - 6 \times a + 5ab - a = 12ab - 6a + 5ab - a$ $\qquad\qquad\qquad\qquad\quad = 17ab - 7a$
10. $-3x^2y \times 2xy = -6x^3y^2$
11. $5(2x + 7) = 10x + 35$
12. $6a\,(3b - 5a) = 18ab - 30a^2$
13. $7m - 9 + 4(m - 6) = 7m - 9 + 4m - 24$ $\qquad\qquad\qquad\quad = 11m - 33$
14. $2s(s - 4) - 5(s + 7) = 2s^2 - 8s - 5s - 35$ $\qquad\qquad\qquad\qquad = 2s^2 - 13s - 35$
15. $\dfrac{4w^2z \times 5yz}{10wy} = \dfrac{20w^2yz^2}{10wy} = 2wz^2$
16. $\dfrac{3xr}{5s^2} \times \dfrac{10s}{18x^2} = \dfrac{30xrs}{90s^2x^2} = \dfrac{r}{3sx}$
17. $18x^2 - 12x = 6x(3x - 2)$
18. $-15x^2y - 25x^2y^2 = -5x^2y(3 + 5y)$

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

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Multiple Choice Answer Sheet

Name_____ <u>Marking Sheet</u>

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 ⬭