

# High School Mathematics Test 2014

Year 10

## Factorisation

Non Calculator

Skills and Knowledge Assessed:

• H

Name \_\_\_\_\_

### Section 1 Short Answer Section

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

1. Factorise  $6a - 24$

.....

2. Factorise  $21m + 28$

.....

3. Factorise  $6k^2 - 12k$

.....

4. Factorise  $-8c^2 - 12bc$ .

.....

5. Factorise  $40pq^2 - 30p^2q$ .

.....

6. Factorise  $16w^2c + 12wc^2$ .

.....

7. Factorise  $32g^3h^2 - 40g^2h^3$ .

.....

8. Factorise  $28z^4a^5 + 21z^3a^2$ .

.....

9. Factorise  $18a^2b - 12ab + 24ab^3$ .

.....

10. Factorise  $p(k + 5) - 7(k + 5)$ .

.....

11. Factorise  $3e^2 + 6e - 4(e + 2)$ .

.....

12. Factorise  $b^2 + 2bg + 6b + 12g$ .

.....

13. Factorise  $a^2 + 9a + 18$ .

.....

14. Factorise  $y^2 - 2y - 24$ .

.....

15. Factorise  $p^2 - 11p + 30$ .

.....

16. Factorise  $m^2 + 3m - 40$ .

.....

17. Factorise  $e^2 - 81$ .

.....

18. Factorise  $g^2 - 16g + 64$ .

.....

19. Factorise  $3m^2 + 11m + 10$ .

.....

.....

20. Factorise  $2s^2 + 9s - 5$ .

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.....

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21. Factorise  $6g^2 + g - 12$ .

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# High School Mathematics Test 2014

Year 10

## Factorisation

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.	Factorise $7k - 28$ .	A. $7(k - 2)$	B. $7(k - 4)$	C. $7(k^2 - 4)$	D. $7(k - 28)$
2.	Factorise $w^2 - 6w$ .	A. $w(w - 2)$	B. $w(w - 3)$	C. $w(w - 6)$	D. $w(2w - 6)$
3.	Factorise $4u^2 - 18u$ .	A. $2u(2u - 9)$	B. $4u(u - 9)$	C. $2u(2u - 18)$	D. $4u(2u - 9)$
4.	Factorise $12p^2 - 16p$ .	A. $4(3p - 4)$	B. $p(3p - 4)$	C. $4p(3 - 4p)$	D. $4p(3p - 4)$
5.	Factorise $18k^2m - 24km^2$ .	A. $6km(3k - 4)$	B. $6m(3k - 4m)$	C. $6km(3k - 4m)$	D. $6k(3k - 4m)$
6.	Factorise $4c(c + e) - 5(c + e)$ .	A. $(c + e)(4c - 5)$	B. $(c - e)(4c + 5)$	C. $(c + e)(4c + 5)$	D. $(c - e)(4c - 5)$
7.	Factorise $2m(2r - 5) - 3n(2r - 5)$ .	A. $(2r - 5)(2m + 3n)$	B. $(2r + 5)(2m - 3n)$	C. $(2r + 5)(2m + 3n)$	D. $(2r - 5)(2m - 3n)$
8.	Factorise $3r(3r - 2) - 2(3r - 2)$ .	A. $(3r - 2)(3r + 2)$	B. $(3r - 2)^2$	C. $(3r + 2)^2$	D. $(3r - 2)(3r + 1)$

9.	Factorise $a^2 + 12a + 20$ . A. $(a + 4)(a + 5)$ C. $(a + 10)(a + 2)$	B. $(a + 10)(a + 10)$ D. $(a + 20)(a + 1)$
10.	Factorise $u^2 - 6u - 40$ . A. $(u - 1)(u + 40)$ C. $(u - 8)(u + 5)$	B. $(u - 2)(u + 20)$ D. $(u - 10)(u + 4)$
11.	Factorise $w^2 - 15w + 54$ . A. $(w - 9)(w - 6)$ C. $(w + 9)(w - 6)$	B. $(w - 18)(w - 3)$ D. $(w + 18)(w - 3)$
12.	Factorise $t^2 + 3t - 108$ . A. $(t - 3)(t + 36)$ C. $(t - 9)(t + 12)$	B. $(t + 3)(t - 36)$ D. $(t + 9)(t - 12)$
13.	Factorise $16w^2 - 49$ . A. $(4w - 7)(4w + 7)$ C. $(4w - 7)^2$	B. $(8w - 7)(2w + 7)$ D. $(4w + 7)^2$
14.	Factorise $2w^2 + 22w + 36$ . A. $(2w + 9)(w + 4)$ C. $(2w + 3)(w + 12)$	B. $(2w + 4)(w + 9)$ D. $(2w + 3)(w + 12)$
15.	Factorise $6c^2 - 17c + 12$ . A. $(2c - 3)(3c + 4)$ C. $(2c - 6)(3c - 2)$	B. $(2c - 3)(3c - 4)$ D. $(2c + 6)(3c - 2)$
16.	Factorise $12a^2 - 56a + 60$ . A. $4(3a + 5)(a - 3)$ C. $12(a + 5)(a - 1)$	B. $12(a - 5)(a - 3)$ D. $4(3a - 5)(a - 3)$

# High School Mathematics Test 2014

## Factorisation

### Multiple Choice Answer Sheet

Name \_\_\_\_\_

Completely fill the response oval representing the most correct answer.

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|-----|---|-----------------------|---|-----------------------|---|-----------------------|---|-----------------------|
| 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"/> |
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| 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"/> |
| 16. | A | <input type="radio"/> | B | <input type="radio"/> | C | <input type="radio"/> | D | <input type="radio"/> |

# High School Mathematics Test 2014

## Factorisation

### ANSWERS

Section 1 ( 1 mark each)	
	Working and Answers
1.	$6a - 24 = 6(a - 4)$
2.	$21m + 28 = 7(3m + 4)$
3.	$6k^2 - 12k = 6k(k - 2)$
4.	$-8c^2 - 12bc = -4c(2c + 3b)$
5.	$40pq^2 - 30p^2q = 10pq(4q - 3p)$
6.	$16w^2c + 12wc^2 = 4wc(4w + 3c)$
7.	$32g^3h^2 - 40g^2h^3 = 8g^2h^2(4g - 5h)$
8.	$28z^4a^5 + 21z^3a^2 = 7z^3a^2(4za^3 + 3)$
9.	$18a^2b - 12ab + 24ab^3 = 6ab(3a - 2 + 4b^2)$
10.	$p(k + 5) - 7(k + 5) = (k + 5)(p - 7)$
11.	$3e^2 + 6e - 4(e + 2) = 3e(e + 2) - 4(e + 2)$ $= (e + 2)(3e - 4)$
12.	$b^2 + 2bg + 6b + 12g = b(b + 2g) + 6(b + 2g)$ $= (b + 2g)(b + 6)$
13.	$a^2 + 9a + 18 = (a + 6)(a + 3)$
14.	$y^2 - 2y - 24 = (y - 6)(y + 4)$
15.	$p^2 - 11p + 30 = (p - 5)(p - 6)$
16.	$m^2 + 3m - 40 = (m + 8)(m - 5)$
17.	$e^2 - 81 = (e - 9)(e + 9)$
18.	$g^2 - 16g + 64 = (g - 8)^2$

19.	$\begin{aligned}3m^2 + 11m + 10 &= 3m^2 + 6m + 5m + 10 \\&= 3m(m + 2) + 5(m + 2) \\&= (3m + 5)(m + 2)\end{aligned}$
20.	$\begin{aligned}2s^2 + 9s - 5 &= 2s^2 + 10s - s - 5 \\&= 2s(s + 5) - 1(s + 5) \\&= (2s - 1)(s + 5)\end{aligned}$
21.	$\begin{aligned}6g^2 + g - 12 &= 6g^2 + 9g - 8g - 12 \\&= 3g(2g + 3) - 4(2g + 3) \\&= (3g - 4)(2g + 3)\end{aligned}$



Section 2 (1 mark each)		
	Working	Answers
1.	$7k - 28 = 7(k - 4)$	B
2.	$w^2 - 6w = w(w - 6)$	C
3.	$4u^2 - 18u = 2u(2u - 9)$	A
4.	$12p^2 - 16p = 4p(3p - 4)$	D
5.	$18k^2m - 24km^2 = 6km(3k - 4m)$	C
6.	$4c(c + e) - 5(c + e) = (c + e)(4c - 5)$	A
7.	$2m(2r - 5) - 3n(2r - 5) = (2r - 5)(2m - 3n)$	D
8.	$3r(3r - 2) - 2(3r - 2) = (3r - 2)(3r - 2) = (3r - 2)^2$	B
9.	$a^2 + 12a + 20 = (a + 10)(a + 2)$	C
10.	$u^2 - 6u - 40 = (u - 10)(u + 4)$	D
11.	$w^2 - 15w + 54 = (w - 9)(w - 6)$	A
12.	$t^2 + 3t - 108 = (t - 9)(t + 12)$	C
13.	$16w^2 - 49 = (4w - 7)(4w + 7)$	A
14.	$2w^2 + 22w + 36 = 2w^2 + 18w + 4w + 36$ $= 2w(w + 9) + 4(w + 9)$ $= (2w + 4)(w + 9)$	B
15.	$6c^2 - 17c + 12 = 6c^2 - 8c - 9c + 12$ $= 2c(3c - 4) - 3(3c - 4)$ $= (2c - 3)(3c - 4)$	B
16.	$12a^2 - 56a + 60 = 12a^2 - 20a - 36a + 60$ $= 4a(3a - 5) - 12(3a - 5)$ $= (4a - 12)(3a - 5)$ $= 4(a - 3)(3a - 5)$	D

# High School Mathematics Test 2014

## Factorisation

### Multiple Choice Answer Sheet

Name Marking Sheet

Completely fill the response oval representing the most correct answer.

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