

**Review on Multiplying & Factoring Polynomials****What is the sum or difference?**

- \_\_\_\_\_ 1.  $2x^8 + 6x^8$   
a.  $12x^8$                       b.  $-4x^8$                       c.  $8x^{16}$                       d.  $8x^8$
- \_\_\_\_\_ 2.  $2x^4 - 6x^4$   
a.  $-4x^8$                       b.  $8x^4$                       c.  $-4x^4$                       d.  $-12x^4$
- \_\_\_\_\_ 3.  $5y^4 + 3y^4$   
a.  $2y^4$                       b.  $15y^4$                       c.  $8y^4$                       d.  $8y^8$
- \_\_\_\_\_ 4. A biologist studied the populations of white-sided jackrabbits and black-tailed jackrabbits over a 5-year period. The biologist modeled the populations, in thousands, with the following polynomials where  $x$  is time in years.

White-sided jackrabbits:  $7.4x^2 - 2.1x + 7.7$ Black-tailed jackrabbits:  $7.5x^2 + 5.4x + 3.7$ 

What polynomial models the total number of white-sided and black-tailed jackrabbits?

- a.  $14.9x^2 + 3.3x + 11.4$                       c.  $-14.9x^2 + 3.3x - 11.4$   
b.  $14.9x^2 - 3.3x - 11.4$                       d.  $14.9x^2 - 3.3x + 11.4$

**Simplify the sum.**

- \_\_\_\_\_ 5.  $(7u^3 + 3u^2 + 5) + (7u^3 - 4u + 3)$   
a.  $8 - 4u + 3u^2 + 14u^3$                       c.  $0u^3 + 3u^2 - 4u + 8$   
b.  $0u^3 - 4u^2 + 3u - 8$                       d.  $14u^3 + 3u^2 - 4u + 8$

**Simplify the difference.**

- \_\_\_\_\_ 6.  $(-7x - 5x^4 + 5) - (-7x^4 - 5 - 9x)$   
a.  $-14x^4 + 10x + 10$                       c.  $2x^4 + 2x + 8$   
b.  $2x^4 + 2x + 10$                       d.  $-14x^4 - 10x + 10$
- \_\_\_\_\_ 7.  $(7w^2 - 6w - 6) - (4w^2 + 4w - 2)$   
a.  $11w^2 + 10w + 4$                       c.  $3w^2 - 2w - 8$   
b.  $11w^2 - 2w - 8$                       d.  $3w^2 - 10w - 4$

**Simplify the product.**

- \_\_\_\_\_ 8.  $2n(n^2 + 3n + 4)$   
a.  $2n^3 + 3n + 4$                       c.  $n^2 + 5n + 4$   
b.  $2n^3 + 6n^2 + 8n$                       d.  $2n^3 + 6n + 8$

9.  $5a^2(3a^4 + 3b + 2)$   
 a.  $8a^6 + 15a^2b + 5a^2$   
 b.  $15a^6 + 15a^2b + 10a^2$   
 c.  $15a^8 + 3b + 10a^2$   
 d.  $8a^4 + 8ab + 5a^2$
10.  $8p(-3p^2 + 6p - 2)$   
 a.  $-5p^3 + 14p^2 - 6p$   
 b.  $48p^2 - 16p - 24p^3$   
 c.  $14p^2 - 6p - 5p^3$   
 d.  $-24p^3 + 48p^2 - 16p$

**Factor the polynomial.**

11.  $14w^7 + 8w^4$   
 a.  $w^4(14w^3 + 8)$   
 b.  $2(7w^7 + 4w^4)$   
 c.  $2w^3(7w^4 + 4w)$   
 d.  $2w^4(7w^3 + 4)$
12.  $54c^3d^8 + 9c^4d^2$   
 a.  $9c^4d^2(6d^2 + 1)$   
 b.  $9c^3d^2(6d^2 + c)$   
 c.  $9c^3d^2(d^2 + 6c)$   
 d.  $9c^4d^2(d^2 + 6)$

**Simplify the product using the distributive property or FOIL.**

13.  $(4h + 7)(2h + 3)$   
 a.  $8h^2 + 2h - 21$   
 b.  $8h^2 - 26h + 21$   
 c.  $8h^2 - 2h - 21$   
 d.  $8h^2 + 26h + 21$
14.  $(-5h - 5)(4h - 2)$   
 a.  $-20h^2 - 30h - 10$   
 b.  $-20h^2 + 30h - 10$   
 c.  $-20h^2 - 10h + 10$   
 d.  $-20h^2 + 10h + 10$
15.  $(3x - 7)(3x - 5)$   
 a.  $9x^2 - 36x - 35$   
 b.  $9x^2 + 36x + 35$   
 c.  $9x^2 - 36x + 35$   
 d.  $9x^2 + 6x + 35$
16.  $(j + 7)(j - 7)$   
 a.  $j^2 - 14j - 49$   
 b.  $j^2 + 14j - 49$   
 c.  $j^2 - 49$   
 d.  $j^2 + 14j - 49$

**What is the factored form of the following expressions?**

17.  $w^2 + 18w + 77$   
 a.  $(w - 7)(w - 11)$   
 b.  $(w + 1)(w + 77)$   
 c.  $(w + 7)(w + 11)$   
 d.  $(w - 7)(w + 11)$
18.  $d^2 + 10d + 21$   
 a.  $(d + 7)(d - 3)$   
 b.  $(d - 7)(d + 3)$   
 c.  $(d - 7)(d - 3)$   
 d.  $(d + 7)(d + 3)$

19.  $d^2 - 9d + 14$   
 a.  $(d+2)(d-7)$  c.  $(d+2)(d+7)$   
 b.  $(d-2)(d-7)$  d.  $(d-2)(d+7)$
20.  $x^2 - x - 42$   
 a.  $(x+7)(x-6)$  c.  $(x-7)(x-6)$   
 b.  $(x-7)(x+6)$  d.  $(x+7)(x+6)$
21. The area of a rectangular garden is given by the trinomial  $x^2 + 2x - 80$ . What are the possible dimensions of the rectangle? Use factoring.  
 a.  $x - 10$  and  $x - 8$  c.  $x - 10$  and  $x + 8$   
 b.  $x + 10$  and  $x + 8$  d.  $x + 10$  and  $x - 8$

**What is the factored form of the expression?**

22.  $6x^2 + 5x + 1$   
 a.  $(3x+1)(2x+1)$  c.  $(3x+1)(2x-1)$   
 b.  $(3x-1)(2x-1)$  d.  $(3x-1)(2x+1)$
23.  $12d^2 + 4d - 1$   
 a.  $(6d-1)(2d-1)$  c.  $(6d+1)(2d+1)$   
 b.  $(6d+1)(2d-1)$  d.  $(6d-1)(2d+1)$
24.  $4g^2 + 9g - 9$   
 a.  $(4g-3)(g-3)$  c.  $(4g+3)(g+3)$   
 b.  $(4g-3)(g+3)$  d.  $(4g+3)(g-3)$
25. The area of a rectangular pool is given by the trinomial  $9y^2 + 6y - 80$ . What are the possible dimensions of the pool? Use factoring.  
 a.  $3y - 8$  and  $3y + 10$  c.  $-3y - 8$  and  $-3y - 10$   
 b.  $3y + 8$  and  $3y - 10$  d.  $3y - 3$  and  $3y + 10$

**What is the factored form of the expression?**

26.  $r^2 - 49$   
 a.  $(r+7)(r+7)$  c.  $(r-7)(r-7)$   
 b.  $(r-7)(r+9)$  d.  $(r-7)(r+7)$
27.  $s^2 - 25$   
 a.  $(s-5)(s-5)$  c.  $(s-5)(s+5)$   
 b.  $(s-5)(s+7)$  d.  $(s+5)(s+5)$

**What is the factored form of the expression?**

28.  $3x^3 + 3x^2 + x + 1$   
 a.  $x(3x^2 + x + 1)$  c.  $(x+3)(3x^2 - 1)$   
 b.  $(x+1)(3x^2 + 1)$  d.  $3x^2(x+1)$

29.  $20g^3 + 24g^2 - 15g - 18$

a.  $(4g^2 - 6)(5g + 3)$

b.  $(4g^2 + 3)(5g - 6)$

c.  $(4g^2 + 6)(5g - 3)$

d.  $(4g^2 - 3)(5g + 6)$

**Factor the common factor out of each expression.**

30)  $-45n^2 - 9$

31)  $-30b^5 + 48b^2 + 6b$

**Factor by grouping.**

32)  $3x^3 - 9x^2 + 2x - 6$

33)  $3x^3 - 2x^2 + 9x - 6$

**Factor by difference of two squares.**

34)  $k^2 - 9$

35)  $9a^2 - 4$

**Factor each completely.**

36)  $n^2 + 7n + 6$

37)  $r^2 + 8r + 15$

38)  $2k^2 - 11k + 15$

39)  $3n^2 - 5n + 2$

## Answer Section

1. D
  2. C
  3. C
  4. A
  5. D
  6. B
  7. D
  8. B
  9. B
  10. D
  11. D
  12. B
  13. D
  14. C
  15. C
  16. C
  17. C
  18. D
  19. B
  20. B
  21. D
  22. A
  23. D
  24. B
  25. A
  26. D
  27. C
  28. B
  29. D
- 30)  $-9(5n^2 + 1)$       31)  $6b(-5b^4 + 8b + 1)$       32)  $(3x^2 + 2)(x - 3)$       33)  $(x^2 + 3)(3x - 2)$   
34)  $(k + 3)(k - 3)$       35)  $(3a + 2)(3a - 2)$       36)  $(n + 6)(n + 1)$       37)  $(r + 3)(r + 5)$   
38)  $(2k - 5)(k - 3)$       39)  $(3n - 2)(n - 1)$

