

3.10 Factoring Special Quadratics

MATHPOWER™ 10, Western Edition, pp. 132-134

Factor, if possible. *difference of Squares*

Factor fully, if possible. *Mixed.*

1. $x^2 - 25$
 $(x+5)(x-5)$

2. $y^2 - 49$
 $(y+7)(y-7)$

21. $x^2 - 196$
 $(x+14)(x-14)$

22. $36y^2 + 6y + 1$
 No

3. $y^4 - 1$
 $(y^2+1)(y^2-1)$

4. $z^2 + 64$
 cannot factor

23. $16a^2 + 40a + 25$
 $(4a+5)^2$

24. $4x^2 - 36$
 $(2x-6)(2x+6)$

5. $4a^2 - 9$
 $(2a+3)(2a-3)$

6. $49 - 64m^2$
 $(7+8m)(7-8m)$

25. $y^2 + 100$
 NO

26. $p^2 - 4pq + 4q^2$
 $(p-2q)^2$

7. $169a^2 - b^2$
 $(13a+b)(13a-b)$

8. $25 + 4x^2$
 cannot factor

27. $36x^2 - 81y^2$
 $(6x-9y)(6x+9y)$

28. $16x^2 + 64y^2$
 No

9. $81x^2 - 121p^2$
 $(9x+11p)(9x-11p)$

*10. $49 - (a-z)^2$
 $(7+a-z)(7-a+z)$

29. $m^3 - 25m$
 $m(m^2-25)$
 $m(m+5)(m-5)$

30. $5n^3 - 30n^2 + 45n$
 $5n(n^2-6n+9)$
 $5n(n-3)(n-3)$

State whether each trinomial is a perfect square trinomial. If it is, factor it. $(a+b)^2$

31. $64x^2 - 16$
 $(8x-4)(8x+4)$

32. $4b^2 + 121$
 NO

11. $x^2 + 8x + 16$
 Yes $(x+4)^2$

12. $y^2 - 14y + 49$
 Yes $(y-7)^2$

33. $x^4 - 13x^2 + 36$
 $(x^2-9)(x^2-4)$

34. $x^4 - 7x^2y^2 + 12y^4$
 $(x^2-3y^2)(x^2-4y^2)$

13. $z^2 - 9z + 9$
 no

14. $\sqrt{9t^2} + 6t + \sqrt{1}$
 Yes $(3t+1)^2$

35. Evaluate each difference of squares by factoring.

15. $\sqrt{4m^2} - 12m + \sqrt{9}$
 no

16. $\sqrt{4x^2} - 20x + \sqrt{25}$
 Yes $(2x-5)^2$

a) $38^2 - 32^2$

b) $55^2 - 45^2$

$(38+32)(38-32)$
 $(70)(6) = 420$

$(55+45)(55-45)$
 $(100)(10) = 1000$

17. $\sqrt{121} - 22m + \sqrt{m^2}$
 Yes $(11-m)^2$ or $(m-11)^2$

c) $760^2 - 240^2$
 $(760+240)(760-240)$
 $(1000)(520) = 520000$

18. $16x^2 + 24xy + 9y^2$
 Yes $(4x+3y)^2$

36. Determine the value(s) of k such that each trinomial is a perfect square.

19. $64a^2 - 30ab + 49b^2$
 Yes $(8a-7b)^2$

a) $\sqrt{x^2} + kx + \sqrt{49}$

b) $\sqrt{9x^2} + kx + \sqrt{25}$

$k = 2ab = 2 \cdot 1 \cdot 7 = 14$

$2ab = 3 \cdot x \cdot x = 30$
 $k = \pm 30$

20. $25x^2 + 30xy + 9y^2$
 Yes $(5x+3y)^2$

c) $4x^2 - 12x + k$
 $12 = 2 \cdot 2 \cdot \sqrt{k}$
 $k = 9$

d) $kx^2 - 40xy + 16y^2$
 25