

3.8 Factoring $x^2 + bx + c$

MATHPOWER™ 10, Western Edition, pp. 125-127

Factor, if possible.

~~6~~ ~~-2~~ 1. $x^2 - 5x + 6 = (x-3)(x-2)$

~~-5~~ ~~-3~~ 2. $y^2 + 2y - 3 = (y+3)(y-1)$

3. $m^2 + 7m - 12$

~~4~~ ~~12~~ ~~3~~ cannot factor.

4. $a^2 + 6a + 5 = (a+5)(a+1)$

~~5~~ ~~5~~ ~~1~~

~~-10~~ ~~10~~ ~~1~~ $x^2 - 9x - 10 = (x-10)(x+1)$

5. $b^2 - 7b + 10 = (b-5)(b-2)$

~~-5~~ ~~10~~ ~~-2~~ 7. $y^2 - 6y + 7 = (y-7)(y+1)$

~~-7~~ ~~7~~ ~~1~~ 8. $x^2 + x - 20 = (x+5)(x-4)$

~~5~~ ~~1~~ ~~-4~~

Factor, if possible.

~~-52~~ 9. $x^2 + 24x - 52 = (x+26)(x-2)$

~~26~~ ~~24~~ 10. $m^2 - 18m + 45 = (m-15)(m-3)$

~~45~~ ~~-18~~ 11. $x^2 + 5x - 36 = (x+9)(x-4)$

~~36~~ ~~5~~ ~~-4~~ 12. $x^2 - 5xy - 66y^2 = (x-11)(x+6)$

~~66~~ ~~6~~ 13. $m^2 + 12mn + 32n^2 = (m+8n)(m+4n)$

~~-5~~ ~~32~~ ~~8~~ 14. $x^2y^2 - 10xy - 24 = (xy-12)(xy+2)$

15. $m^2n^2 + 15mn + 54 = (mn+9)(mn+6)$

16. $42 + y - y^2 = (7-y)(6+y)$

17. $32 + 4x - x^2$ (can't factor)

~~1~~ ~~2~~ ~~4~~ ~~8~~ ~~16~~ ~~32~~ 18. $x^4 + 7x^2 + 12 = (x^2+3)(x^2+4)$

Factor completely.

19. $2x^2 + 10x + 12 = 2(x^2 + 5x + 6)$
 $= 2(x+3)(x+2)$

20. $3x^2 + 9x - 12 = 3(x^2 + 3x - 4)$
 $= 3(x-1)(x+4)$

21. $5x^2 - 35x + 50 = 5(x^2 - 7x + 10)$
 $= 5(x-5)(x-2)$

22. $4x^2 - 16x - 48 = 4(x^2 - 4x - 12)$
 $= 4(x-6)(x+2)$

23. $3x^2y + 27xy + 60y = 3y(x^2 + 9x + 20)$
 $= 3y(x+4)(x+5)$

24. $2x^2 - 16x - 66 = 2(x^2 - 8x - 33)$
 $= 2(x-11)(x+3)$

25. $2x^2y^2 - 6xy^2 - 56y^2 = 2y^2(x^2 - 3x - 28)$
 $= 2y^2(x-7)(x+4)$

26. $x^3 - 13x^2 + 42x = x(x^2 - 13x + 42)$
 $= x(x-6)(x-7)$

27. The area of a doubles tennis court can be represented approximately by the trinomial $x^2 - x - 42$.

a) Factor $x^2 - x - 42$ to find binomials that represent the length and width of a doubles tennis court.

$(x-7)(x+6)$

b) If x represents 17.8 m, find the length and width of a doubles tennis court, to the nearest tenth of a metre.

17.8
 17.0
 10.8 (width) 17.8
 $+ 6.0$
 23.8 (length)

28. Find a value for k and then factor.

a) $x^2 - 9x + k$ b) $x^2 + kx + 6$

$x^2 - 9x + 20 = (x-4)(x-5)$ $x^2 + 7x + 6 = (x+1)(x+6)$