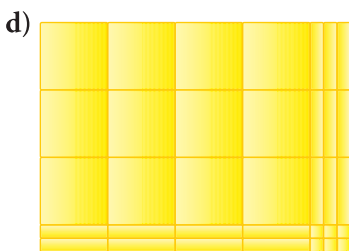
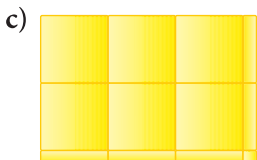
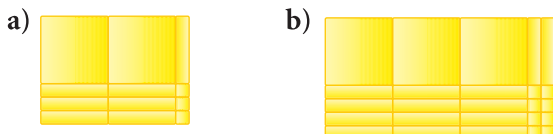


Exercises

A

5. Write the multiplication sentence that each set of algebra tiles represents.



6. Use algebra tiles to determine each product.

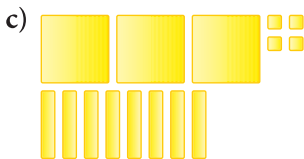
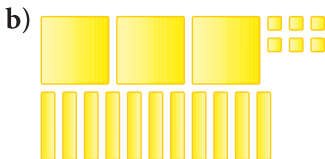
a) $(2v + 3)(v + 2)$ b) $(3r + 1)(r + 4)$
 c) $(2g + 3)(3g + 2)$ d) $(4z + 3)(2z + 5)$
 e) $(3t + 4)(3t + 4)$ f) $(2r + 3)(2r + 3)$

7. For each set of algebra tiles below:

i) Write the trinomial that the algebra tiles represent.

ii) Arrange the tiles to form a rectangle. Sketch the rectangle.

iii) Use the rectangle to factor the trinomial.



B

8. Copy and complete each statement.

a) $(2w + 1)(w + 6) = 2w^2 + \square w + 6$

b) $(2g - 5)(3g - 3) = 6g^2 + \square + \circ$

c) $(-4v - 3)(-2v - 7) = \square + \circ + 21$

9. Expand and simplify.

a) $(5 + f)(3 + 4f)$

b) $(3 - 4t)(5 - 3t)$

c) $(10 - r)(9 + 2r)$

d) $(-6 + 2m)(-6 + 2m)$

e) $(-8 - 2x)(3 - 7x)$

f) $(6 - 5n)(-6 + 5n)$

10. Expand and simplify.

a) $(3c + 4)(5 + 2c)$

b) $(1 - 7t)(3t + 5)$

c) $(-4r - 7)(2 - 8r)$

d) $(-9 - t)(-5t - 1)$

e) $(7h + 10)(-3 + 5h)$

f) $(7 - 6y)(6y - 7)$

11. a) Use algebra tiles to factor each polynomial. Sketch the tiles you used.

i) $3t^2 + 4t + 1$

ii) $3t^2 + 8t + 4$

iii) $3t^2 + 12t + 9$

iv) $3t^2 + 16t + 16$

b) What patterns do you see in the algebra-tile rectangles? How are these patterns shown in the binomial factors?

c) Write the next 3 trinomials in the pattern and their binomial factors.

12. Factor. What patterns do you see in the trinomials and their factors?

a) i) $2n^2 + 13n + 6$ ii) $2n^2 - 13n + 6$

b) i) $2n^2 + 11n - 6$ ii) $2n^2 - 11n - 6$

c) i) $2n^2 + 7n + 6$ ii) $2n^2 - 7n + 6$

13. Factor. Check by expanding.

a) $2y^2 + 5y + 2$ b) $2a^2 + 11a + 12$

c) $2k^2 + 13k + 15$ d) $2m^2 - 11m + 12$

e) $2k^2 - 11k + 15$ f) $2m^2 + 15m + 7$

g) $2g^2 + 15g + 18$ h) $2n^2 + 9n - 18$

14. a) Find two integers with the given properties.

	Product	Sum
i)	15	16
ii)	24	14
iii)	15	8
iv)	12	7
v)	12	13
vi)	24	11

- b) Use the results of part a to use decomposition to factor each trinomial.
- i) $3v^2 + 16v + 5$ ii) $3m^2 + 14m + 8$
 iii) $3b^2 + 8b + 5$ iv) $4a^2 + 7a + 3$
 v) $4d^2 + 13d + 3$ vi) $4v^2 + 11v + 6$

15. Factor. Check by expanding.

- a) $5a^2 - 7a - 6$ b) $3y^2 - 13y - 10$
 c) $5s^2 + 19s - 4$ d) $14c^2 - 19c - 3$
 e) $8a^2 + 18a - 5$ f) $8r^2 - 14r + 3$
 g) $6d^2 + d - 5$ h) $15e^2 - 7e - 2$

16. Find and correct the errors in each factorization.

- a) $6u^2 + 17u - 14 = (2u - 7)(3u + 2)$
 b) $3k^2 - k - 30 = (3k - 3)(k + 10)$
 c) $4v^2 - 21v + 20 = (4v - 4)(v + 5)$

17. Find and correct the errors in this solution of factoring by decomposition.

$$\begin{aligned} 15g^2 + 17g - 42 &= 15g^2 - 18g + 35g - 42 \\ &= 3g(5g - 6) + 7(5g + 6) \\ &= (3g + 7)(5g + 6) \end{aligned}$$

18. Factor.

- a) $20r^2 + 70r + 60$ b) $15a^2 - 65a + 20$
 c) $18h^2 + 15h - 18$ d) $24u^2 - 72u + 54$
 e) $12m^2 - 52m - 40$ f) $24g^2 - 2g - 70$

19. Factor.

- a) $14y^2 - 13y + 3$ b) $10p^2 - 17p - 6$
 c) $10r^2 - 33r - 7$ d) $15g^2 - g - 2$
 e) $4x^2 + 4x - 15$ f) $9d^2 - 24d + 16$
 g) $9t^2 + 12t + 4$ h) $40y^2 + y - 6$
 i) $24c^2 + 26c - 15$ j) $8x^2 + 14x - 15$

20. Find an integer to replace \square so that each trinomial can be factored.

How many integers can you find each time?

- a) $4s^2 + \square s + 3$ b) $4h^2 + \square h + 25$
 c) $6y^2 + \square y - 9$ d) $12t^2 + \square t + 10$
 e) $9z^2 + \square z + 1$ f) $\square f^2 + 2f + \square$

C

21. a) Factor, if possible.

- i) $4r^2 - r - 5$ ii) $2t^2 + 10t + 3$
 iii) $5y^2 + 4y - 2$ iv) $2w^2 - 5w + 2$
 v) $3h^2 - 8h - 3$ vi) $2f^2 - f + 1$

- b) Choose two trinomials from part a: one that can be factored and one that cannot be factored. Explain why the first trinomial can be factored and the second one cannot be factored.

22. a) Factor each trinomial.

- i) $3n^2 + 11n + 10$ ii) $3n^2 - 11n + 10$
 iii) $3n^2 + 13n + 10$ iv) $3n^2 - 13n + 10$
 v) $3n^2 + 17n + 10$ vi) $3n^2 - 17n + 10$

- b) Look at the trinomials and their factors in part a. Are there any other trinomials that begin with $3n^2$, end with $+10$, and can be factored? Explain.

23. Find all the trinomials that begin with $9m^2$, end with $+16$, and can be factored.

Reflect

Which strategies can you use to factor a trinomial? Give an example of when you might use each strategy to factor a trinomial.