5-Minute Check Over Lesson 8–3

4 **Which expression represents the area of the figure?** area = length x width

A. $6a^3 - 9a^2 + 2a - 3$ units^2

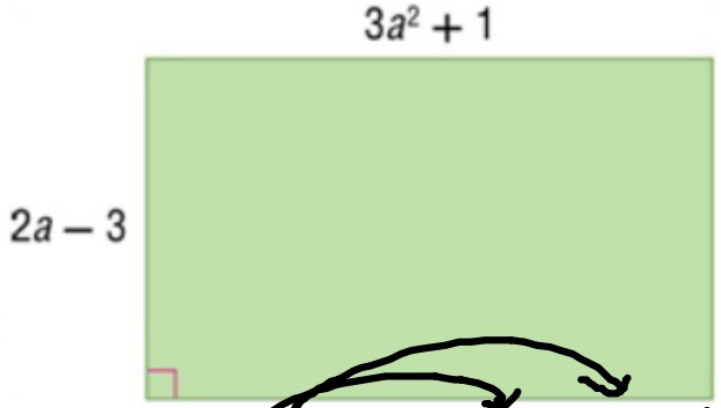
B. $5a^3 - 2a^2 + 2a - 2$ units^2

C. $4a^3 - 2a^2 + a - 2$ units^2

D. $3a^3 - a^2 + 3a + 3$ units^2

5-Minute Check Over Lesson 8–3

4 Which expression represents the area of the figure?



$(3a^2+1)(2a-3)$

$6a^3 - 9a^2 + 2a - 3$

A. $6a^3 - 9a^2 + 2a - 3$ units^2

B. $5a^3 - 2a^2 + 2a - 2$ units^2

C. $4a^3 - 2a^2 + a - 2$ units^2

D. $3a^3 - a^2 + 3a + 3$ units^2

8-4 Special Products

"difference of squares"

Yesterday, there were a couple of problems that resulted in a "special" case;

last night's HW →

19. $(7n - 6)(7n - 6)$

19. $49n^2 - 84n + 36$

20. $(12t - 5)(12t + 5)$ $144t^2 - 25$

perfect squares!

cancelled!

KeyConcept Square of a Difference

Words	The square of $a - b$ is the square of a minus twice the product of a and b plus the square of b.
Symbols	$(a - b)^2 = (a - b)(a - b) = a^2 - 2ab + b^2$
Example	$(x - 3)^2 = (x - 3)(x - 3) = x^2 - 6x + 9$

this also exist for sum...

KeyConcept Product of a Sum and a Difference

Words	The product of $a + b$ and $a - b$ is the square of a minus the square of b.
Symbols	$(a + b)(a - b) = (a - b)(a + b) = a^2 - b^2$

KeyConcept Square of a Sum

KeyConcept Product of a Sum and a Difference

Words The product of $a + b$ and $a - b$ is the square of a minus the square of b.

Symbols
$$(a + b)(a - b) = (a - b)(a + b)$$
$$= a^2 - b^2$$

KeyConcept Square of a Difference

Words The square of $a - b$ is the square of a minus twice the product of a and b plus the square of b.

Symbols
$$(a - b)^2 = (a - b)(a - b)$$
$$= a^2 - 2ab + b^2$$

Example
$$(x - 3)^2 = (x - 3)(x - 3)$$
$$= x^2 - 6x + 9$$

In this chapter, it was meant to help remember special patterns when it comes to multiplying polynomials together.

Example 4 Product of a Sum and a Difference

Find $(2x^2 + 3)(2x^2 - 3)$.

$$(a + b)(a - b) = a^2 - b^2$$ Product of a sum and a difference

$$(2x^2 + 3)(2x^2 - 3) = (2x^2)^2 - (3)^2$$ $a = 2x^2$ and $b = 3$

$$= 4x^4 - 9$$ Simplify.

These will be important patterns to recognize when it comes to *doing this in reverse* (we will be doing this later).

"Factoring"

Besides that, we can multiply by using the box method from yesterday!~

Check Your Understanding

= Step-by-Step Solutions begin on page R13.

Examples 1–2 Find each product. **4.** $9m^2 - 24m + 16$ **5.** $g^2 - 8gh + 16h^2$ **6.** $9c^2 + 36cd + 36d^2$

1. $(x + 5)^2$ $x^2 + 10x + 25$ **2.** $(11 - a)^2$ $121 - 22a + a^2$ **3** $(2x + 7y)^2$ $4x^2 + 28xy + 49y^2$

4. $(3m - 4)(3m - 4)$ **5.** $(g - 4h)(g - 4h)$ **6.** $(3c + 6d)^2$

D y

1

$(x+5)(x+5)$

	x	5
x	x^2	$5x$
5	$5x$	25

exact

$x^2 + 10x + 25$

Check Your Understanding

= Step-by-Step Solutions begin on page R13.

Examples 1–2 Find each product. 4. $9m^2 - 24m + 16$ 5. $g^2 - 8gh + 16h^2$ 6. $9c^2 + 36cd + 36d^2$

1. $(x + 5)^2$ $x^2 + 10x + 25$
2. $(11 - a)^2$ $121 - 22a + a^2$
3. $(2x + 7y)^2$ $4x^2 + 28xy + 49y^2$
4. $(3m - 4)(3m - 4)$
5. $(g - 4h)(g - 4h)$
6. $(3c + 6d)^2$

D y

$(3c+6d)(3c+6d)$

(4) $9m^2$ $+16$ $-24m$

	3c	6d
3c	$9c^2$	$18cd$
6d	$18cd$	$36d^2$

exact

	2x	7y
2x	$4x^2$	$14x^2$
7y	$14x^2$	$49y^2$

Example 3

7. GENETICS The color of a Labrador retriever's fur is genetic. Dark genes D are dominant over yellow genes y. A dog with genes DD or Dy will have dark fur. A dog with genes yy will have yellow fur. Pepper's genes for fur color are Dy, and Ramiro's are yy.

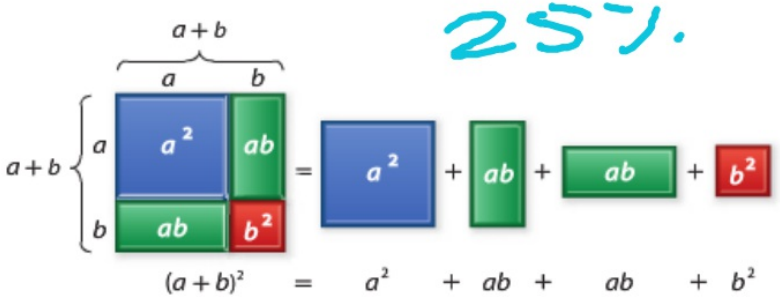
	D	y
D	DD	Dy
y	Dy	yy

a. Write an expression for the possible fur colors of Pepper's and Ramiro's puppies.

b. What is the probability that a puppy will have yellow fur?

25%. a. $DD + 2Dy + yy$

hint:



⑧ $(a-3)(a+3)$

$a^2 - 9$

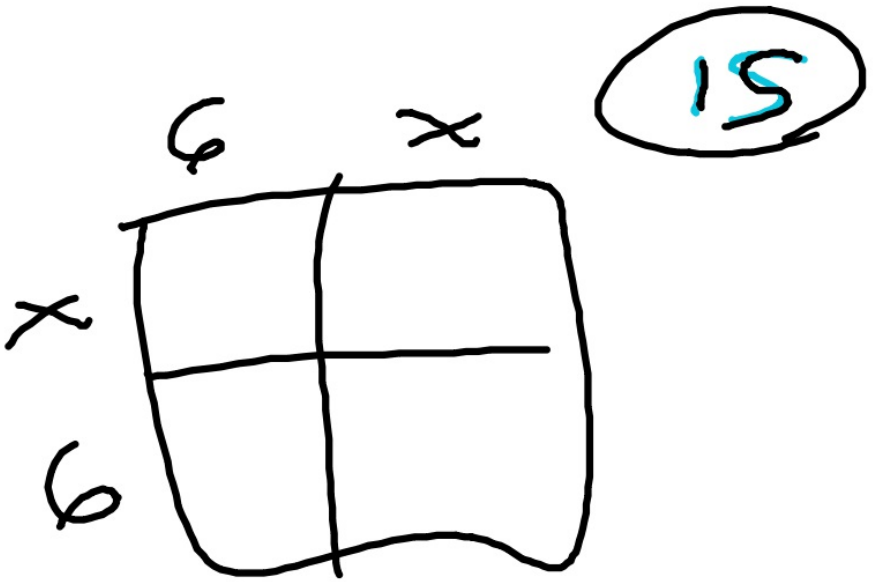
⑨ $(x+5)(x-5)$

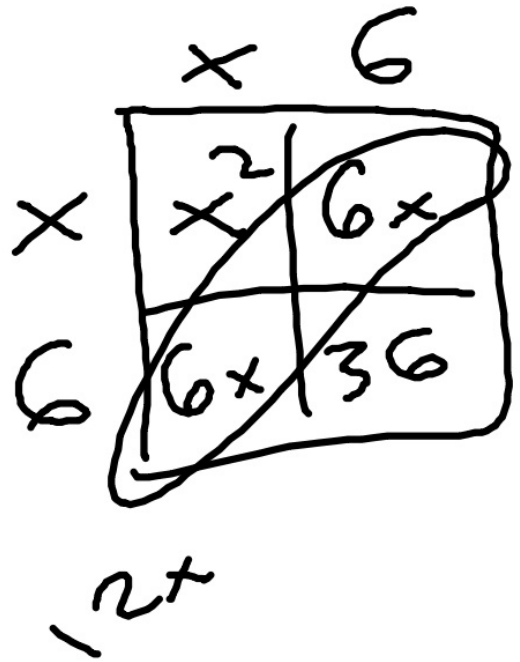
$= x^2 - 25$

Examples 1–2 Find each product.

12. $(a + 10)(a + 10)$ $a^2 + 20a + 100$
13. $(b - 6)(b - 6)$ $b^2 - 12b + 36$
14. $(h + 7)^2$ $h^2 + 14h + 49$
15. $(x + 6)^2$ $x^2 + 12x + 36$
16. $(8 - m)^2$ $64 - 16m + m^2$
17. $(9 - 2y)^2$ $81 - 36y + 4y^2$
18. $(2b + 3)^2$ $4b^2 + 12b + 9$
19. $(5t - 2)^2$ $25t^2 - 20t + 4$
20. $(8h - 4n)^2$ $64h^2 - 64hn + 16n^2$

(x+6)(x+6)





Examples 1–2 Find each product.

12. $(a + 10)(a + 10)$ $a^2 + 20a + 100$
13. $(b - 6)(b - 6)$ $b^2 - 12b + 36$
14. $(h + 7)^2$ $h^2 + 14h + 49$
15. $(x + 6)^2$ $x^2 + 12x + 36$
16. $(8 - m)^2$ $64 - 16m + m^2$
17. $(9 - 2y)^2$ $81 - 36y + 4y^2$
18. $(2b + 3)^2$ $4b^2 + 12b + 9$
19. $(5t - 2)^2$ $25t^2 - 20t + 4$
20. $(8h - 4n)^2$ $64h^2 - 64hn + 16n^2$

$(9 - 2y)(9 - 2y)$

17

	9	$-2y$
9	81	$-18y$
$-2y$	$-18y$	$4y^2$

Example 3

21. **GENETICS** The ability to roll your tongue is inherited genetically from parents if either parent has the dominant trait T. Children of two parents without the trait will not be able to roll their tongues.

	T	t
T	TT	Tt
t	Tt	tt

a. Show how the combinations can be modeled by the square of a sum. $(T + t)^2 = T^2 + 2Tt + t^2$

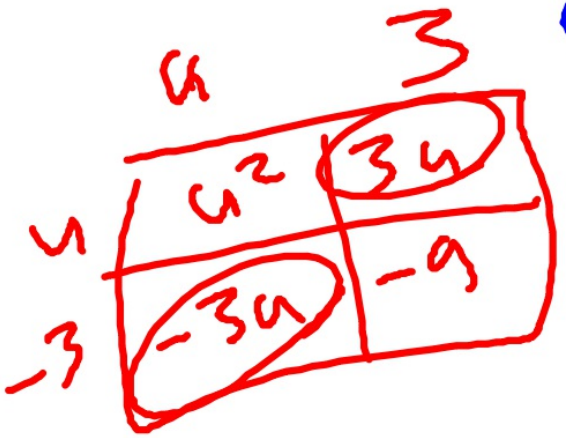
b. Predict the percent of children that will have both dominant genes, one dominant gene, and both recessive genes. *TT*: 25%; *Tt*: 50%; *tt*: 25%

Example 4 **Find each product.** **22–44. See margin.**

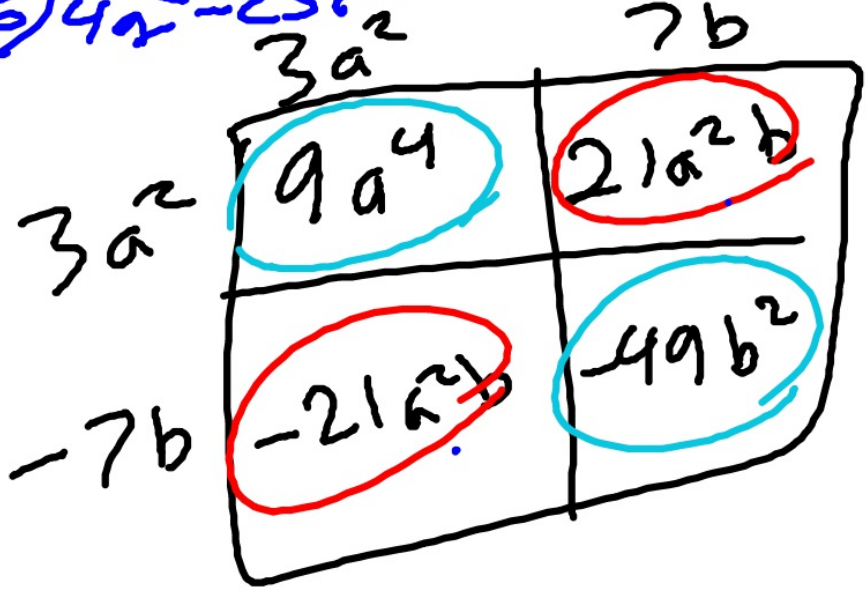
conjugate!

22. $(u + 3)(u - 3)$ **23.** $(b + 7)(b - 7)$ **24.** $(2 + x)(2 - x)$

25. $(4 - x)(4 + x)$ **26.** $(2q + 5r)(2q - 5r)$ **27.** $(3a^2 + 7b)(3a^2 - 7b)$



(26) $4q^2 - 25r^2$



cancel!!!