had her hair cut to a length of 10 inches. If her hair grows at a rate of 0.02 inch per day,
uation represents the length (L) of Theresa's hair, in inches, after d days?

= 0.2 + 10L

= 10 + 0.2L

= 0.2 + 10d

= 10 + 0.2d

ı set contains only ordered pairs that satisfy $y = 3x + 7$?

(2, 13) and (4, 18)

(3, 16) and (5, 22)

(4, 19) and (6, 24)

(5, 22) and (7, 27)

ley wrote four sets of ordered pairs on the whiteboard for her math students.

h set is y a function of x ?

3, -2), (3, -2), (-2, 1), (2, 1), (0, 0)}

l, -2), (4, 2), (2, -4), (2, 4), (4, 4)}

1, 2), (4, 3), (-1, 5), (-6, -2), (-2, 1)}

), 2), (4, 5), (-3, -3), (0, -1), (6, -2)}

Example 1 Factor Differences of Squares

Factor each polynomial.

a. $16h^2 - 9a^2$

$16h^2 - 9a^2 = (4h)^2 - (3a)^2$ Write in the form of $a^2 - b^2$

$= (4h + 3a)(4h - 3a)$ Factor the difference of squares.

b. $121 - 4b^2$

$121 - 4b^2 = (11)^2 - (2b)^2$ Write in the form of $a^2 - b^2$

$= (11 - 2b)(11 + 2b)$ Factor the difference of squares.

c. $27g^3 - 3g$

Because the terms have a common factor, factor out the GCF first. Then proceed with other factoring techniques.

$27g^3 - 3g = 3g(9g^2 - 1)$ Factor out the GCF of $3g$.

$= 3g[(3g)^2 - (1)^2]$ Write in the form $a^2 - b^2$

$= 3g(3g - 1)(3g + 1)$ Factor the difference of squares.

GuidedPractice

1A. $81 - c^2$

1B. $64g^2 - h^2$

1C. $9x^3 - 4x$

1D. $-4y^3 + 9y$

A $(4h)^2 - (3a)^2$

$(4h+3a)(4h-3a)$

$16h^2 - 12ah + 12ah - 9a^2$

$16h^2 - 9a^2$

C $3g(9g^2 - 1)$

$3g[(3g)^2 - (1)^2]$

$3g[(3g+1)(3g-1)]$

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ⓐ $81-c^2$

$(9)^2-(c)^2$

$(9+c)(9-c)$

ⓑ $64g^2-h^2$

$(8g)^2-(h)^2$

$(8g+h)(8g-h)$

© $9x^3 - 4x$

$x(9x^2 - 4)$

$x[(3x)^2 - (2)^2]$

$x[(3x+2)(3x-2)]$

(d) $-4y^3 + 9y$

$-y(4y^2 - 9)$

$-y[(2y)^2 - (3)^2]$

$-y[(2y+3)(2y-3)]$

Example 2 Apply a Technique More than Once

Factor each polynomial.

a. $b^4 - 16$

$b^4 - 16 = (b^2)^2 - (4)^2$ Write $b^4 - 16$ in $a^2 - b^2$ form.

$= (b^2 + 4)(b^2 - 4)$ Factor the difference of squares.

$= (b^2 + 4)(b^2 - 2^2)$ $b^2 - 4$ is also a difference of squares.

$= (b^2 + 4)(b + 2)(b - 2)$ Factor the difference of squares.

b. $625 - x^4$

$625 - x^4 = (25)^2 - (x^2)^2$ Write $625 - x^4$ in $a^2 - b^2$ form.

$= (25 + x^2)(25 - x^2)$ Factor the difference of squares.

$= (25 + x^2)(5^2 - x^2)$ Write $25 - x^2$ in $a^2 - b^2$ form.

$= (25 + x^2)(5 - x)(5 + x)$ Factor the difference of squares.

$b^4 - 16$

$(b^2)^2 - (4)^2$

$(b^2+4)(b^2-4)$

$(b^2+4)(b+2)(b-2)$

Guided Practice

2A. $y^4 - 1$

2B. $4a^4 - b^4$

2C. $81 - x^4$

2D. $16y^4 - 1$

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Example 1 Recognize and Factor Perfect Square Trinomials

Determine whether each trinomial is a perfect square trinomial. Write *yes* or *no*. If so, factor it.

a. $4y^2 + 12y + 9$

1. Is the first term a perfect square? Yes, $4y^2 = (2y)^2$.
2. Is the last term a perfect square? Yes, $9 = 3^2$.
3. Is the middle term equal to $2(2y)(3)$? Yes, $12y = 2(2y)(3)$

Since all three conditions are satisfied, $4y^2 + 12y + 9$ is a perfect square trinomial.

$4y^2 + 12y + 9 = (2y)^2 + 2(2y)(3) + 3^2$ Write as $a^2 + 2ab + b^2$

$= (2y + 3)^2$ Factor using the pattern.

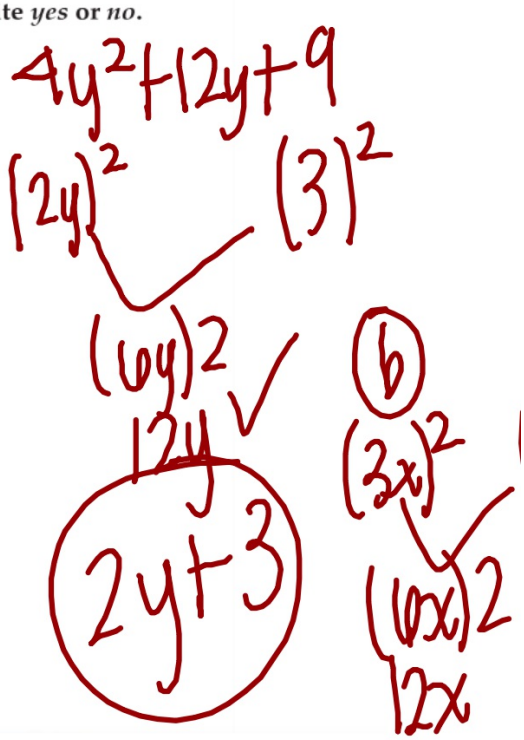
b. $9x^2 - 6x + 4$

1. Is the first term a perfect square? Yes, $9x^2 = (3x)^2$.
2. Is the last term a perfect square? Yes, $4 = 2^2$.
3. Is the middle term equal to $-2(3x)(2)$? No, $-6x \neq -2(3x)(2)$.

Since the middle term does not satisfy the required condition, $9x^2 - 6x + 4$ is not a perfect square trinomial.

GuidedPractice

1A. $9y^2 + 24y + 16$ **1B.** $2a^2 + 10a + 25$



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(A) $9y^2+24y+16$

$(3y)$ (4)

$(12y)2$

$24y$

yes

$(3y+4)^2$

(B) $2a^2+10a+25$

$2a^2=10$

Practice

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