HMH Algebra 1
Week 3

Factor & Solve
Perfect Square/
difference of
2
Sq.s

Example: (FACTOR)

① $x^2 + 10xy + 25y^2$

x^2	$5xy$
$5xy$	$25y^2$

$x + 5y$

$$\begin{array}{c|c} 25 & +10 \\ \hline 5 \cdot 5 & 5+5 = 10 \end{array}$$

The only difference here is that it has an x and y variable...

$$(x+5y)(x+5y) = (x+5y)^2$$

- - - - - - - - - -

Example: FACTOR

③ $81x^2 - 121y^2$ ← difference of 2 squares
$a^2 - b^2 = (a-b)(a+b)$

$$\boxed{(9x - 11y)(9x + 11y)}$$

- - - - - - - - - -

Example

⑧ $\dfrac{4x^3 - 16x}{4x} = \dfrac{0}{4x}$

factor out a common factor

$4x(x^2 - 4) = 0$ → difference of 2 squares

$4x(x-2)(x+2) = 0$

$\dfrac{4x}{4} = \dfrac{0}{4}$ $\begin{array}{c} x-2=0 \\ +2 +2 \end{array}$ $\begin{array}{c} x+2=0 \\ -2 -2 \end{array}$

$\boxed{x=0}$ $\boxed{x=2}$ $\boxed{x=-2}$

LESSON 21-3

Using Special Factors to Solve Equations

Practice and Problem Solving: A/B

Factor using the perfect-square technique.

1. $x^2 + 10xy + 25y^2$

2. $32x^2 + 80xy + 50y^2$

_____   _____

Factor using the difference of squares technique.

3. $81x^2 - 121y^2$

4. $75x^3 - 48x$

_____   _____

Solve each equation with special factors.

5. $50x^2 = 72$

6. $18x^3 + 48x^2 = -32x$

_____   _____

Solve.

7. A projectile is launched from a hole in the ground one foot deep. Its height follows the equation $h = -16t^2 + 8t - 1$. Use factoring by perfect-squares to find the time when the projectile lands back on the ground. (Hint: Landing on the ground means projectile height is zero.)

_____

8. Which of the following are solutions to $4x^3 - 16x = 0$?

   ○ A −2   ○ B −1   ○ C 0   ○ D 1   ○ E 2

HMH Algebra 1

Week 3

This worksheet is just like ws 371

WS 371   1-8, skip 7

LESSON 21-3

Using Special Factors to Solve Equations

Practice and Problem Solving: C

Factor using the perfect-square technique.

1. $27x^2 + 72xy + 48y^2$

2. $25x^3 - 60x^2y + 36xy^2$

_____   _____

Factor using the difference of squares technique.

3. $x^4 - 81$

4. $36x^4 - 16x^2y^2$

_____   _____

Solve each equation with special factors.

5. $-7x^3 + 100x = -75x$

6. $x^3 + 8x^2 + 4x = -x^3 - 4x$

_____   _____

Solve.

7. A projectile is launched from an underground silo 81 feet deep. Its height follows the equation $h = -16t^2 + 72t - 81$. Use factoring by perfect-squares to find the time when the projectile lands back on the ground.

_____

8. Which of the following are solutions to $81x^3 = 256x$?

   A $-\dfrac{16}{9}$ B $-\dfrac{4}{3}$ C 0   D $\dfrac{16}{9}$

HMH Algebra 1
Week 3

Example ① don't worry about Algebra Tiles, just Factor

$x^2 - 10x + 25$

x^2	$-5x$
$-5x$	$+25$

x
$-$
5

$x - 5$

$(x-5)(x-5) = \boxed{(x-5)^2}$

$+25$	-10
$-5 \cdot -5$	$-5 + -5 = -10 \checkmark$

---

⑪ $25x^2 + 20x + 4 = 0$

$25x^2$	$10x$
$10x$	$+4$

$5x$
$+$
2

$\dfrac{100}{10 \cdot 10} \Big| \dfrac{+20}{10 + 10}$

$5x + 2$

$(5x+2)(5x+2) = 0$

$5x + 2 = 0 \quad 5x + 2 = 0$
$\underline{-2 \; -2} \quad \underline{-2 \; -2}$
$\dfrac{5x}{5} = \dfrac{-2}{5} \quad \dfrac{5x}{5} = \dfrac{-2}{5}$

$\boxed{x = -\dfrac{2}{5}}$

WS 1018 - 1019
1 - 18
This is a 2 day assignment

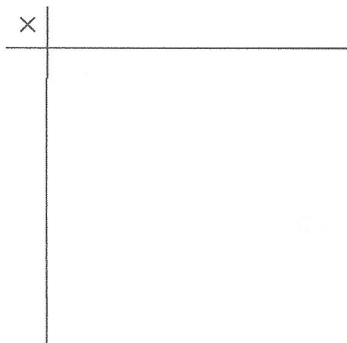For each trinomial, draw algebra tiles to show the factored form. Then, write the factored form.

1. $x^2 - 10x + 25$

×

2. $x^2 + 8x + 16$

×
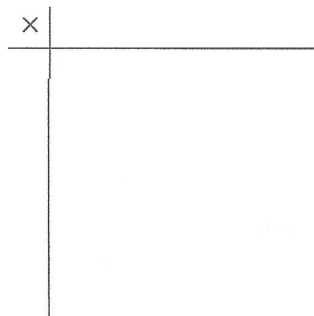
Factor.

3. $4x^2 + 4x + 1$

4. $9x^2 - 18x + 9$

5. $16x^3 + 8x^2 + x$

6. $32x^3 - 16x^2 + 2x$

7. $x^2 - 169$

8. $4p^2 - 9q^4$

9. $32x^4 - 8x^2$

10. $2y^5 - 32z^4y$

Solve the following equations with special factors.

11. $25x^2 + 20x + 4 = 0$

12. $x^3 - 10x^2 + 25x = 0$

13. $4x^4 + 8x^3 + 4x^2 = 0$

14. $4x^2 - 8x + 4 = 0$

15. $x^2 - 81 = 0$

16. $2x^3 - 2x = 0$

17. $16q^2 - 81 = 0$

18. $4p^4 - 25p^2 = -16p^2$