

Chapter 4 - Factoring Day 4 Wks

Example 1

Factor using the Difference of Two Squares

5. $n^2 - 25$

$$\begin{array}{r} n^2 + 0x - 25 \\ \hline (n-5)(n+5) \end{array}$$

5

$$\begin{array}{r} (a+b)(a-b) \\ a^2 - ab + ab - b^2 \\ a^2 - b^2 \end{array}$$

$$\begin{array}{r} n^2 - 25 \\ (n)^2 - (5)^2 \\ \hline (n+5)(n-5) \end{array}$$

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Example 1

Factor using the Difference of Two Squares

6. $m^2 - 225$

$$\begin{aligned} & (\underline{m})^2 - (\underline{15})^2 \\ \boxed{(m+15)(m-15)} \end{aligned}$$

9. $49x^2 - 4 = 0$

$$\begin{aligned} & (\underline{7x})^2 - (\underline{2})^2 \\ \boxed{(7x+2)(7x-2)} = 0 \end{aligned}$$

$7x+2=0$

$x = \frac{-2}{7}$

$7x-2=0$

$x = \frac{2}{7}$

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Example 2

Factor using the Perfect Square Trinomials

14. $4x^2 - 4x + 1$

$AC = 4$
-2 -2

$4x^2 - 2x - 2x + 1$
 $\cancel{2x}(2x-1) - \cancel{1}(2x-1)$

$(2x-1)(2x-1)$
 $(2x-1)^2$

$$\begin{aligned}
 & (a-b)^2 \\
 & (a-b)(a-b) \\
 & a^2 - ab - ab + b^2 \\
 & a^2 - 2ab + b^2 \\
 & 4x^2 - 4x + 1 \\
 & (2x)^2 - 2(2x)(1) + 1^2 \\
 & (2x-1)^2
 \end{aligned}$$

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Example 2

Factor using the Perfect Square Trinomials

$$15. x^2 + 8x + 16$$

Diagram showing the factoring of $x^2 + 8x + 16$ into $(x+4)^2$. The terms x^2 , 16 , and $8x$ are circled in green. The middle term $8x$ is labeled $2(x)(4)$. A bracket groups x^2 and 16 with a label $(x+4)^2$ below it.

$$18. 16n^2 + 72n + 81$$

Diagram showing the factoring of $16n^2 + 72n + 81$ into $(4n+9)^2$. The terms $16n^2$, 81 , and $72n$ are circled in blue. The middle term $72n$ is labeled $2(4n)(9)$. A bracket groups $16n^2$ and 81 with a label $(4n+9)^2$ below it.

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Example 3

Solve by Factoring.

20. $64x^2 - 49 = 0$

$$(8x)^2 - (7)^2 = 0$$

$$(8x + 7)(8x - 7) = 0$$

$$8x + 7 = 0$$

$$x = -\frac{7}{8}$$

$$8x - 7 = 0$$

$$x = \frac{7}{8}$$

22. $x^2 + 6x = 40$

$$x^2 + 6x - 40 = 0$$

$$10 \quad -4$$

$$(x+10)(x-4) = 0$$

$$x = -10 \quad x = 4$$

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Example 3

Solve by Factoring.

23. $3x^2 = 9x$

$$3x^2 - 9x = 0$$

$$3x(x-3) = 0$$

$$\begin{cases} 3x = 0 \\ x-3 = 0 \end{cases}$$

$$\begin{cases} x=0 \\ x=3 \end{cases}$$

28. $6r^3 + 19r^2 = 7r$

$$6r^3 + 19r^2 - 7r = 0$$

$$r(6r^2 + 19r - 7) = 0$$

$$AC = -42$$

$$r(6r^2 + 21r - 2r - 7) = 0$$

$$r(3r(2r+7) - 1(2r+7)) = 0$$

$$r(2r+7)(3r-1) = 0$$

$$\begin{cases} r=0 \\ 2r+7=0 \\ 3r-1=0 \end{cases}$$

$$\begin{cases} r=0 \\ r=-\frac{7}{2} \\ r=\frac{1}{3} \end{cases}$$