Section 4 – Topic 4
Solving Quadratic Equations by Factoring – Special Cases – Part 2

ax^2+bx+c

Consider the binomial $4x^2 - 9$. Write the binomial as a trinomial.

Factor the trinomial.

$a \cdot c$

-36 | 0

6 6 | $\frac{6}{4}$ $\frac{-6}{4}$

$\sqrt{4x^2} = 2x$

$\sqrt{9} = 3$

$\left(x+\frac{3}{2}\right)\left(x-\frac{3}{2}\right)$

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

$49k^2 - 64 = 0$

$4x^2 - 9$ is an example of the difference of two squares.

Things to note about the difference of squares: $a^2 - b^2$.

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

- Both terms are perfect squares.
- It's the difference of squares, **NOT** the sum.
- $(a^2 - b^2) = (a + b)(a - b)$.

$7k+8=0$

$7k=-8$

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

$7k-8=0$

$7k=8$

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

Let's Practice!

1. Solve the equation $49k^2 = 64$.

$\frac{49k^2}{49} = \frac{64}{49}$

$k^2 = \frac{64}{49}$

$k = \pm\frac{8}{7}$

2. Factor $4x^2 - 36x^6$.

$\sqrt{4x^2} = 2x$

$\sqrt{36x^6} = 6x^3$

$(2x+6x^3)(2x-6x^3)$

3. Factor $9s^6 - r^8$.

$(3s^3+r^4)(3s^3-r^4)$

Try it!

4. Solve the equation $256x^2 = 196$.

$x^2 = \frac{196}{256}$

$x = \pm \frac{14}{16} = \boxed{\pm \frac{7}{8}}$

5. Factor $32a^2b - 50b^3$

$2b(16a^2 - 25b^2)$

$2b(4a+5b)(4a-5b)$

6. Factor $x^2 + 144$.

not possible

BEAT THE TEST!

1. The perfect square trinomial $ax^2 + bx + c$ is equivalent to $(x - 0.9)^2$. Which of the following is the sum of b and c?

   Ⓐ -1.8
   Ⓑ -0.99
   Ⓒ 0.81
   Ⓓ 2.61

$(x-0.9)(x-0.9)$
$x^2-0.9x-0.9x+.81$
$x^2-1.8x+.81$
$-1.8+.81$

2. Create an expression that represents the complete factorization of $P(a) = 8a^3 - 98a$.

$\rightarrow 2a(4a^2-49)$

$2a(2a-7)(2a+7)$

$2a=0$
$a=0$

$2a-7=0$
$2a=7$
$a=7/2$
$a=3.5$

Mark with a point on top of the number line the possible solutions for $P(a) = 0$.