

Notes: Completing the Square: Imaginary and Complex Numbers

Solve each by completing the square:

$x^2 - 4x + 5 = 0$ $x^2 - 4x + 4 = -5 + 4$ $(x-2)^2 = -1$ $x-2 = \pm i$ $x = 2 \pm i$	$m^2 + 25 = -8m$ $m^2 + 8m + 16 = -25 + 16$ $(m+4)^2 = -9$ $m = -4 \pm 3i$
$6p^2 - 8p + 6 = 0$ $6(p^2 - \frac{8}{6}p) = -6$ $6(p^2 - \frac{4}{3}p + \frac{4}{9}) = 36 + \frac{8}{3}$ $6(p - \frac{2}{3})^2 = \frac{-10}{3}$ $(p - \frac{2}{3})^2 = \frac{-10}{18}$	$x^2 - 6x + 12 = 0$ $x^2 - 6x + 9 = -12 + 9$ $(x-3)^2 = -3$ $x = 3 \pm i\sqrt{3}$

Solve #1-6 by completing the square. Convert #7-10 to vertex form.

1) $7n^2 - 14n - 53 = 3$

$n = -2, 4$

3) $p^2 - 10p + 27 = 6$

$p = 3, 7$

5) $8x^2 + 16x - 48 = 6$

$x = -1 \pm \frac{\sqrt{31}}{2}$

7) $a^2 + 14a - 69 = 6$

$a^2 + 14a + 49 = 75 + 49$

$(a+7)^2 = 124$

$(a+7)^2 - 124$

9) $6n^2 - 12n - 11 = 7$

$6n^2 - 12n = 18$

$6(n^2 - 2n + 1) = 18 + 6$

$6(n-1)^2 = 24$

$6(n-1)^2 - 24 = 0$

2) $a^2 + 8a - 11 = -7$

$a = -4 \pm 2\sqrt{5}$

4) $x^2 - 4x + 75 = -5$

$x = 2 \pm 2i\sqrt{19}$

6) $p^2 - 16p + 75 = 10$

$p = 8 \pm i$

8) $n^2 + 18n - 79 = 7$

$n^2 + 18n + 81 = 86 + 81$

$(n+9)^2 = 167$

$(n+9)^2 - 167$

10) $r^2 - 18r - 72 = -9$

$r^2 - 18r + 81 = 63 + 81$

$(r-9)^2 = 144$

$(r-9)^2 - 144$

HOMework!