10-3 Completing the Square

Find the value of c that makes the expression a perfect square trinomial. Then write the expression as the square of a binomial

Ex: $x^2 + 10x + c$ $c = 25$ 5^2 square $= (x+5)^2$

$5x$ $5x$ $\frac{1}{2}(10)$

Ex: $x^2 + 14x + c$ $c = 49$ 7^2 $= (x+7)^2$

$\frac{1}{2}(14)$

$(a=1)$ $(\frac{b}{2})^2$

$x^2 + bx + (\frac{b}{2})^2 = (x + \frac{b}{2})^2$

$\frac{1}{2} \cdot b$

Ex: $x^2 - 24x + 144 = (x-12)^2$

Ex: $x^2 - 9x + c$ $c = (-\frac{9}{2})^2$ $\frac{81}{4}$ $= (x - \frac{9}{2})^2$

Ex: $x^2 + 16x + 64 = (x+8)^2$

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$6f^2 - \frac{3}{2}f + \frac{1}{12}$

1·6
2·3

$\frac{1}{1}\cdot\frac{1}{12}$
$\frac{1}{2}\cdot\frac{1}{6}$
$\frac{1}{3}\cdot\frac{1}{4}$

$(f - \frac{1}{3})(6f - \frac{1}{4})$

$(2f - \frac{1}{3})(3f - \frac{1}{4})$

$\frac{2}{4} - \frac{1}{2}$

$\frac{1}{12}$ $12(6f^2 - \frac{3}{2}f - \frac{1}{12})$

$\frac{1}{12}(\quad)$

$\frac{1}{12}12(6f^2 - \frac{3}{2}f + \frac{1}{12})$

1·1

$\frac{1}{12}(72f^2 - 18f + 1)$

1·72
2·36
3·24
4·18
6·12

$\frac{1}{12}(6f - 1)(12f - 1)$

$(2f - \frac{1}{3})(3f - \frac{1}{4})$

$\frac{1}{4}\cdot\frac{1}{3}(6f - 1)(12f - 1)$

15. $45x^2 - 103x^2 + 12$

$-58x^2 + 12$

$-2(29x^2 - 6)$

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Grouping : 4 terms or more

if ⊖, take out ⊖ as part of GCF

Ex: $x^3+7x^2-9x-63$ Find GCF of each group

$x^2(x+7)-9(x+7)$

$(x+7)(x^2-9)$

$(x+7)(x+3)(x-3)$

ax^2-9a

$a(x^2-9)$

Ex: $3x^2-5x+9x-15$

$x(3x-5)+3(3x-5)$

$(3x-5)(x+3)$

Ex: $x^3-3x^2-16x+48$

$x^2(x-3)-16(x-3)$

$(x-3)(x^2-16)$

$(x-3)(x-4)(x+4)$

Sum (Difference) of Two Cubes

$$a^3+b^3=(a+b)(a^2-ab+b^2)$$

$a^3-a^2b+ab^2$

$a^2b-ab^2+b^3$

a^3+b^3

Ex: $w^3+27=(w+3)(w^2-3w+9)$

$3w$ opposite

Ex: $27x^3-125$ $a^3+b^3=(a+b)(a^2-ab+b^2)$

$(3x-5)(9x^2+15x+25)$

$-15x$ opp

Ex: $-2d^5+250d^2$

$-2d^2(d^3-125)$

$-2d^2(d-5)(d^2+5d+25)$

$-5d$

p. 54 (13-21) all p. 115 (11-31) odd

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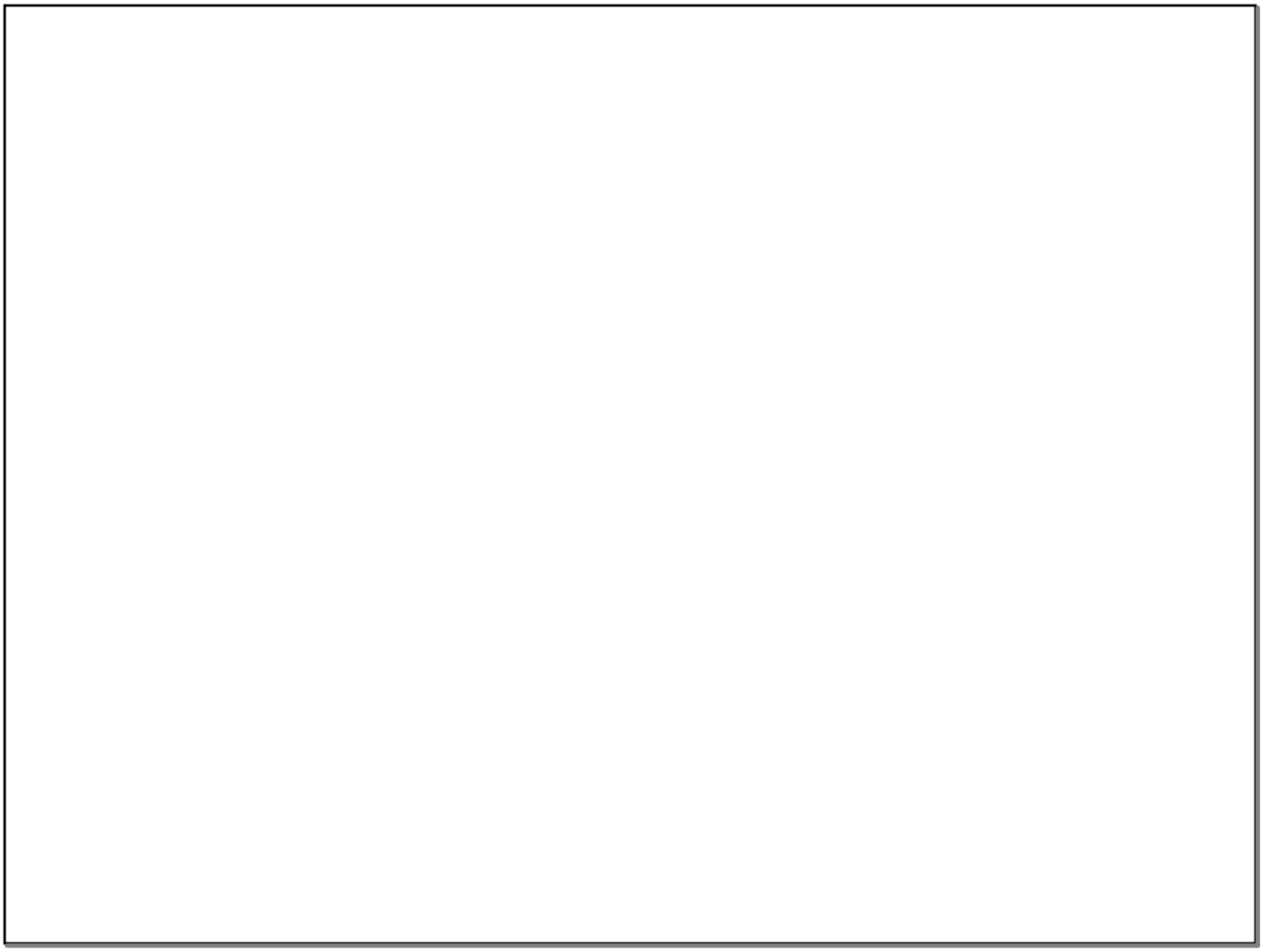

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