

9.3 Factor Trinomials (by grouping)

Algebra 1

Name: Solutions

Practice

Factor each trinomial by **GROUPING**. Some problems may not factor.

<p>1. $9n^2 + 55n + 6$ 54 $\begin{matrix} 1 & 54 \\ & 57 \end{matrix}$</p> <p>$9n^2 + 54n + n + 6$ $9n(\underline{n+6}) + 1(\underline{n+6})$</p> <p>$(n+6)(9n+1)$</p>	<p>2. $4p^2 + 4p - 15$ -60 $\begin{matrix} 1 & 60 \\ 2 & 30 \\ 3 & 20 \\ 4 & 15 \\ 5 & 12 \\ 6 & 10 \end{matrix}$</p> <p>$4p^2 - 6p + 10p - 15$ $2p(\underline{2p-3}) + 5(\underline{2p-3})$</p> <p>$(2p-3)(2p+5)$</p>	<p>3. $x^2 + 3x - 40$ -40 $\begin{matrix} 1 & 40 \\ 2 & 20 \\ 4 & 10 \\ 5 & 8 \end{matrix}$</p> <p>$x^2 - 5x + 8x - 40$ $x(\underline{x-5}) + 8(\underline{x-5})$</p> <p>$(x-5)(x+8)$</p>
<p>4. $10x^2 + 3x - 4$ -40 $\begin{matrix} -5 & 8 \end{matrix}$</p> <p>$10x^2 - 5x + 8x - 4$ $5x(\underline{2x-1}) + 4(\underline{2x-1})$</p> <p>$(2x-1)(5x+4)$</p>	<p>5. $-12y^2 - 34y - 24$ 72 $\begin{matrix} 9 & 8 \end{matrix}$</p> <p>$-2(6y^2 + 17y + 12)$ $-2[6y^2 + 9y + 8y + 12]$ $-2[3y(\underline{2y+3}) + 4(\underline{2y+3})]$</p> <p>$-2(2y+3)(3y+4)$</p>	<p>6. $4x^2 + 10x - 1$ -4</p> <p>Does not factor!</p>
<p>7. $3x^2 + 10x + 8$ 24 $\begin{matrix} 1 & 24 \\ 2 & 12 \\ 3 & 8 \\ 4 & 6 \end{matrix}$</p> <p>$3x^2 + 4x + 6x + 8$ $x(\underline{3x+4}) + 2(\underline{3x+4})$</p> <p>$(3x+4)(x+2)$</p>	<p>8. $3x^2 + 2x - 6$ -18 $\begin{matrix} 1 & 18 \\ 2 & 9 \\ 3 & 6 \end{matrix}$</p> <p>Does not factor!</p>	<p>9. $5t^2 - 11t + 6$ 30 $\begin{matrix} 1 & 30 \\ 2 & 15 \\ 3 & 10 \\ 5 & 6 \end{matrix}$</p> <p>$5t^2 - 5t - 6t + 6$ $5t(\underline{t-1}) - 6(\underline{t-1})$</p> <p>$(t-1)(5t-6)$</p>
<p>10. $p^3 + 12p^2 + 20p$ $P(P^2 + 12P + 20)$ 20 $\begin{matrix} 10 & 2 \end{matrix}$</p> <p>$P[P^2 + 10P + 2P + 20]$ $P[P(\underline{P+10}) + 2(\underline{P+10})]$</p> <p>$P(P+10)(P+2)$</p>	<p>11. $10w^2 - 7w + 1$ 10 $\begin{matrix} -1 & -10 \\ -2 & -5 \end{matrix}$</p> <p>$10w^2 - 2w - 5w + 1$ $2w(\underline{5w-1}) - 1(\underline{5w-1})$</p> <p>$(5w-1)(2w-1)$</p>	<p>12. $-14x^2 - 5x + 1$ -14 $\begin{matrix} -2 & 7 \end{matrix}$</p> <p>$-(14x^2 + 5x - 1)$ $-(14x^2 - 2x + 7x - 1)$ $-[2x(\underline{7x-1}) + 1(\underline{7x-1})]$</p> <p>$-(7x-1)(2x+1)$</p>

13. $25x^2 - 64$

Difference of squares!

$$(5x-8)(5x+8)$$

14. $100x^2 - 49$

Difference of squares!

$$(10x-7)(10x+7)$$

15. $9x^2 - 1$

Difference of squares!

$$(3x-1)(3x+1)$$

Solve each equation by factoring.

16. $5p^2 - 11p = 12$

$$5p^2 - 11p - 12 = 0$$

$$5p^2 + 4p - 15p - 12 = 0$$

$$p(5p+4) - 3(5p+4) = 0$$

$$(5p+4)(p-3) = 0$$

$$5p+4=0 \quad p-3=0$$

$$p = -\frac{4}{5} \quad p = 3$$

$$\begin{array}{r} -60 \\ 1 \quad 60 \\ 2 \quad 30 \\ 3 \quad 20 \\ 4 \quad -15 \end{array}$$

17. $2x^3 + 25x = 15x^2$

$$2x^3 - 15x^2 + 25x = 0$$

$$x(2x^2 - 15x + 25) = 0$$

$$x[2x^2 - 5x - 10x + 25] = 0$$

$$x[x(2x-5) - 5(2x-5)] = 0$$

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

$$x=0 \quad x=\frac{5}{2} \quad x=5$$

$$\begin{array}{r} 50 \\ 1 \quad 50 \\ 2 \quad 25 \\ -5 \quad -10 \end{array}$$

18. $24x^2 + 18x + 3 = 0$

$$3(8x^2 + 6x + 1) = 0$$

$$3(8x^2 + 2x + 4x + 1) = 0$$

$$3[2x(4x+1) + 1(4x+1)] = 0$$

$$3(4x+1)(2x+1) = 0$$

$$x = -\frac{1}{4} \quad x = -\frac{1}{2}$$

$$\begin{array}{r} 8 \\ 2 \quad 4 \end{array}$$

19. $3x^2 - 7x = -2$

$$3x^2 - 7x + 2 = 0$$

$$3x^2 - x - 6x + 2 = 0$$

$$x(3x-1) - 2(3x-1) = 0$$

$$(3x-1)(x-2) = 0$$

$$3x-1=0 \quad x-2=0$$

$$x = \frac{1}{3} \quad x = 2$$

$$\begin{array}{r} 6 \\ -1 \quad -6 \end{array}$$