

Common Factor

1. $15m^5n^3p$ - $30n^7p^3$ + $60m^4n^8p^5$

$$\underline{15n^3p} \left(\underline{m^5n^0p^0} - \underline{2n^4p^2} + \underline{4m^4n^5p^4} \right)$$

$$15n^3p \left(m^5 - 2n^4p^2 + 4m^4n^5p^4 \right)$$

Simple Trinomial

2. $x^2 - 2x - 35$

$$(x+5)(x-7)$$

larger factor
is negative

$$\underline{5} + \underline{-7} = \underline{-2}$$

-35

$$\underline{5} \times \underline{-7} = \underline{-35}$$

1 x -35

5 x -7

signs are
different

Common Factor

3. 270xy² - 180x³y - 90xy

$$\underline{90xy} (3x^0y^1 - 2x^2y^0 - x^0y^0)$$

$$90xy(3y - 2x^2 - 1)$$

Common Factor / Hard Trinomial

4. $4x^2 - 14x - 8$

$$2(\underline{2x^2} - \underline{7x} - \underline{4})$$

$$2(\overset{\curvearrowright}{\underline{2}}x + \underline{1})(x - \underline{\frac{8}{2}})$$

$$2(2x+1)(x-4)$$

larger factor
is a negative

$$\underline{1} + \underline{-8} = \underline{-7}$$

$$\underline{1} \times \underline{-8} = \underline{-8}$$

Signs are
different

$$\begin{array}{r} -8 \\ \hline 1x-8 \\ 2x-4 \end{array}$$

Difference of Squares

5. $4x^2 - 49$

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

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

$$\sqrt{49} = 7$$

Homework

A photograph of a notebook page with handwritten algebraic factorizations. The page is divided into two columns by a vertical line. The left column contains three problems, and the right column contains two. Each problem shows a polynomial expression followed by its factored form.

1. $b^2 - 16$ $(b - 4)(b + 4)$	2. $4x^2 - 9$ $(2x - 3)(2x + 3)$
3. $36y^5x^3 + 20y^3x^3 - 32y^2$ $4y^2(9y^3x^3 + 5yx^3 - 8)$	4. $64 + 56b^2 - 32a$ $8(8 + 7b^2 - 4a)$
5. $90u^4v^3 + 90^4 + 180$ $90(10u^3v^3 + u^3 + 2)$	6. $9n^2 - 25$ $(3n - 5)(3n + 5)$

7. $x^2 - 9$
 $(x-3)(x+3)$

8. $10k^2 + 83k + 24$
 $-+ = 83$
 $-x = -240$
 $\begin{array}{r} 1 \ 240 \\ 2 \ 120 \\ 3 \ 80 \\ 4 \ 60 \\ 5 \ 48 \\ 6 \ 40 \\ 8 \ 30 \\ 10 \ 24 \\ 12 \ 20 \\ 15 \ 16 \end{array}$
 $(k + \frac{3}{10})(k + \frac{80}{10})$
 $(10k+3)(k+8)$

9. $10p^2 - 17p - 63$
 $-+ = -17$
 $-x = -630$
 $\begin{array}{r} 1 \ -630 \\ 2 \ -315 \\ 3 \ -210 \\ 5 \ -126 \\ 6 \ -105 \\ 7 \ -90 \\ 9 \ -70 \\ 10 \ -63 \end{array}$
 $\begin{array}{r} 14 \ -45 \\ 15 \ -42 \\ 18 \ -35 \\ 21 \ -30 \end{array}$
 $(p + \frac{18}{10})(p - \frac{35}{10})$
 $(p + \frac{9}{5})(p - \frac{7}{2})$
 $(5p+9)(2p-7)$

$$10. 9n^2 + 33n + 28 \quad -+ = 33$$

$$\left(\frac{n+12}{9}\right)\left(\frac{n+21}{9}\right)$$

$$\left(n + \frac{4}{3}\right)\left(n + \frac{7}{3}\right)$$

$$(3n+4)(3n+7)$$

$$-x = 252$$

1	252
2	126
3	84
4	63
6	42
7	36
9	28
<u>12</u>	<u>21</u>
14	18

$$11. 9a^2 - 92a + 20 \quad -+ = -92$$

$$\left(\frac{a-2}{9}\right)\left(\frac{a-90}{9}\right)$$

$$(9a-2)(a-10)$$

$$-x = 180$$

-1	-180
<u>-2</u>	<u>-90</u>
-3	-60
-4	-45
-5	-36
-6	-30
-9	-20
-10	-18
-12	-15

$$12. n^2 - 1$$

$$(n-1)(n+1)$$

$(9a-2)(a-10)$.4-45 -5-36 -6-30 -9-20 -10-18 -12-15
13. $a^2 - 9$ $(a-3)(a+3)$	14. $6b^4a + 3b^2a^2 - 15b$ $3b(2b^3a + ba^2 - 5)$
15. $10x^6y^2 + 35xy^6 + 45x^2$ $5x(2x^5y^2 + 7y^6 + 9x)$	16. $9 - 45b + 45ab$ $9(1 - 5b + 5ab)$ ↑ <u>important</u>

$$17. 6x^2y^2z + 3xyz^2 - 18xyz$$

$$3xyz(2xy + z - 6)$$

$$19. K^2 - 16$$

$$(K-4)(K+4)$$

$$18. 63g^6p^5r^2 + 21g^5p^4 + 28g^3$$

$$7g^3(9g^3p^5r^2 + 3g^2p^4 + 4)$$

$$20. 4p^2 + 12p + 9 \quad -t = 12$$

$$-x = 36$$

$$\left(p + \frac{6}{4}\right) \left(p + \frac{6}{4}\right)$$

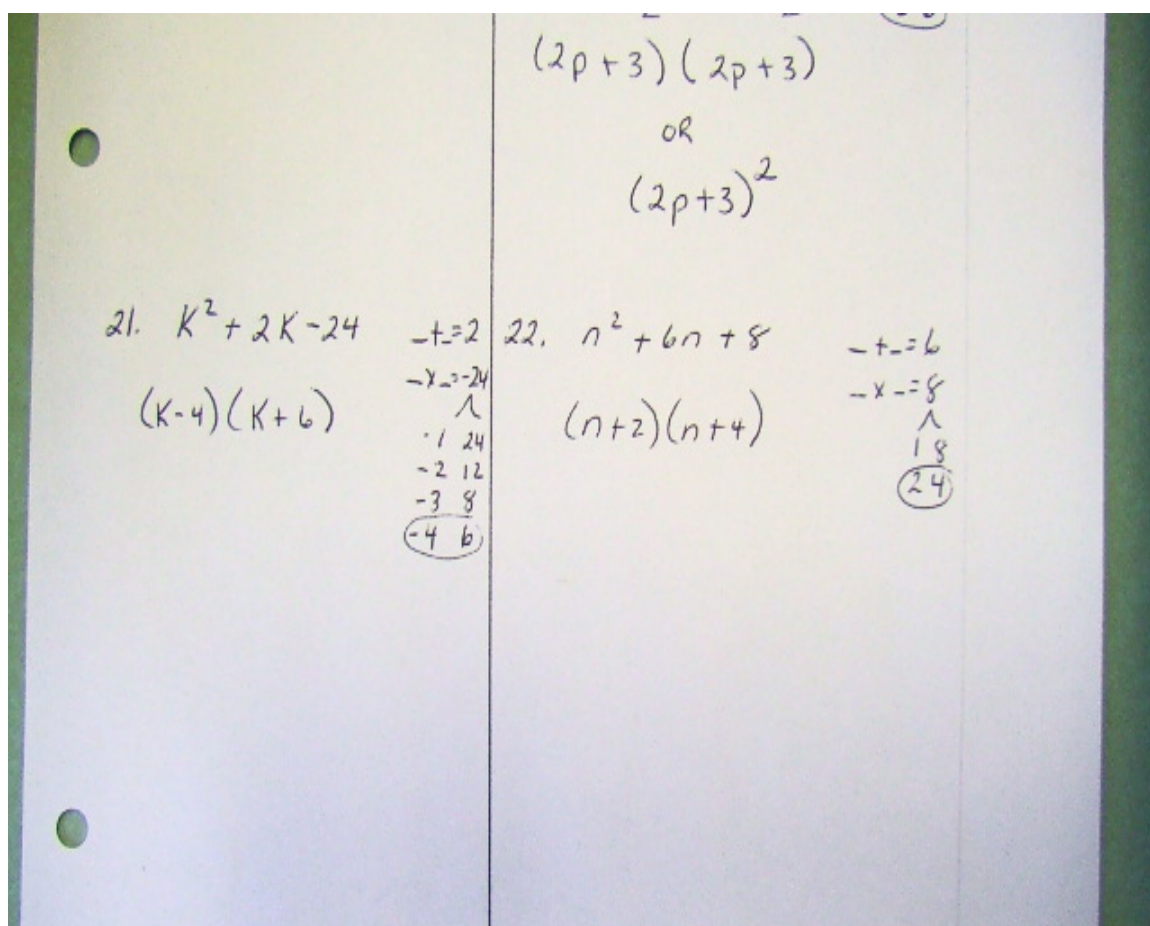
$$\left(p + \frac{3}{2}\right) \left(p + \frac{3}{2}\right)$$

$$(2p+3)(2p+3)$$

OR

$$(2p+3)^2$$

$$\begin{array}{r} 1 \\ 1 \ 36 \\ 3 \ 12 \\ 4 \ 9 \\ \hline 6 \ 6 \end{array}$$



<p>23.</p> $(4K+5)(5K-5)$ $20K^2 - 20K + 25K - 25$ $20K^2 + 5K - 25$	<p>24.</p> $(5n-2)(5n+1)$ $25n^2 + 5n - 10n - 2$ $25n^2 - 5n - 2$
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25.

$$\underline{7x^4} - \underline{1} + \underline{x^2} + \underline{2x} + \underline{7x^2} + \underline{8x} + \underline{4}$$

$$7x^4 + 3 + 8x^2 + 10x$$

or

$$7x^4 + 8x^2 + 10x + 3$$

26.

$$\underline{2p^4} - \underline{7p^3} - \underline{4p^2} - \underline{8p} + \underline{2p} + \underline{8p^4} + \underline{7p^3}$$

$$10p^4 - 4p^2 - 6p$$