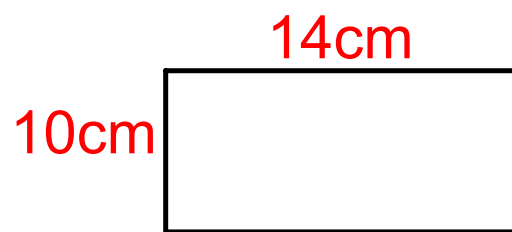
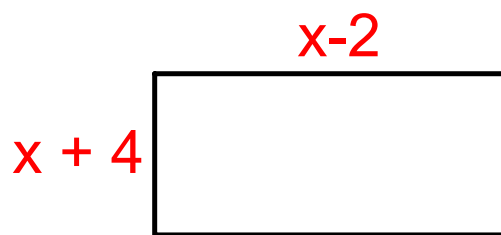


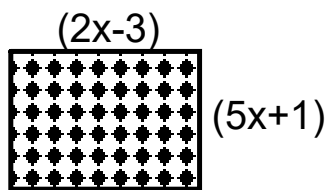
Determine the area:



Determine the area:



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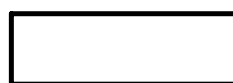
Which of the following can be represented by a rectangle?

$$\begin{array}{l} ___ + ___ = -7 \\ ___ \times ___ = -30 \end{array}$$

$$5a^2 - 7a - 6$$



$$5a^2 - 12a - 6$$



$$\begin{array}{l} ___ + ___ = -12 \\ ___ \times ___ = -30 \end{array}$$

Common Factoring

$$22w^7 - 88z^{14}$$

$$4r^8 - 16r^7s^9 + 2r^{10}$$

$$g^4x^2 - g^9x^5$$

Trinomial

$$4z^2 + 16z + 7$$

$$m^2 - 10m - 9$$

Difference of Squares

$$64v^2 - 81$$

$$x^2 - 16$$

$$- \quad + \quad = -9$$

$$- \quad \times \quad = 16$$

$$16$$

$$-1x - 16$$

$$-2x - 8$$

$$-4x - 4$$

$$x^2 - 9x + 16$$

Not Possible

Choose a polynomial out of the bag and then determine which type of factoring it is.

How Are Your Factoring Skills?

Factor each of the following:

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

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

3. $270xy^2 - 180x^3y - 90xy$

4. $5x^2 + 14xy - 3y^2$

5. $4x^2 - 14x - 8$

6. $4x^2 - 49$

Common factor

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

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

Simple trinomial

$$2. \quad x^2 - \underline{2x} - \underline{35}$$

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

larger factor is negative

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

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

$$-35$$

$$1x - 35$$

$$\underline{5x - 7}$$

signs are different

Common factor

3. 270xy² - 180x³y - 90xy

90xy (3y - 2x² - 1)

Hard trinomial

4. $5x^2 + 14xy - 3y^2$

$(x - 1y)(x + 15y)$

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

larger factor is positive

$-1 + 15 = 14$

$-1 \times 15 = -15$

-15

-1×15

-3×5

signs are different

Hard trinomial

5. $4x^2 - 14x - 8$

$(x + \frac{2}{4})(x - \frac{16}{4})$

$(x + \frac{1}{2})(x - 4)$

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

larger factor is negative

$2 + -16 = -14$ $-3a$
 $2 \times -16 = -32$ $1x - 3a$
 $2x - 16$
 $4x - 8$

signs are different

Difference of Squares:

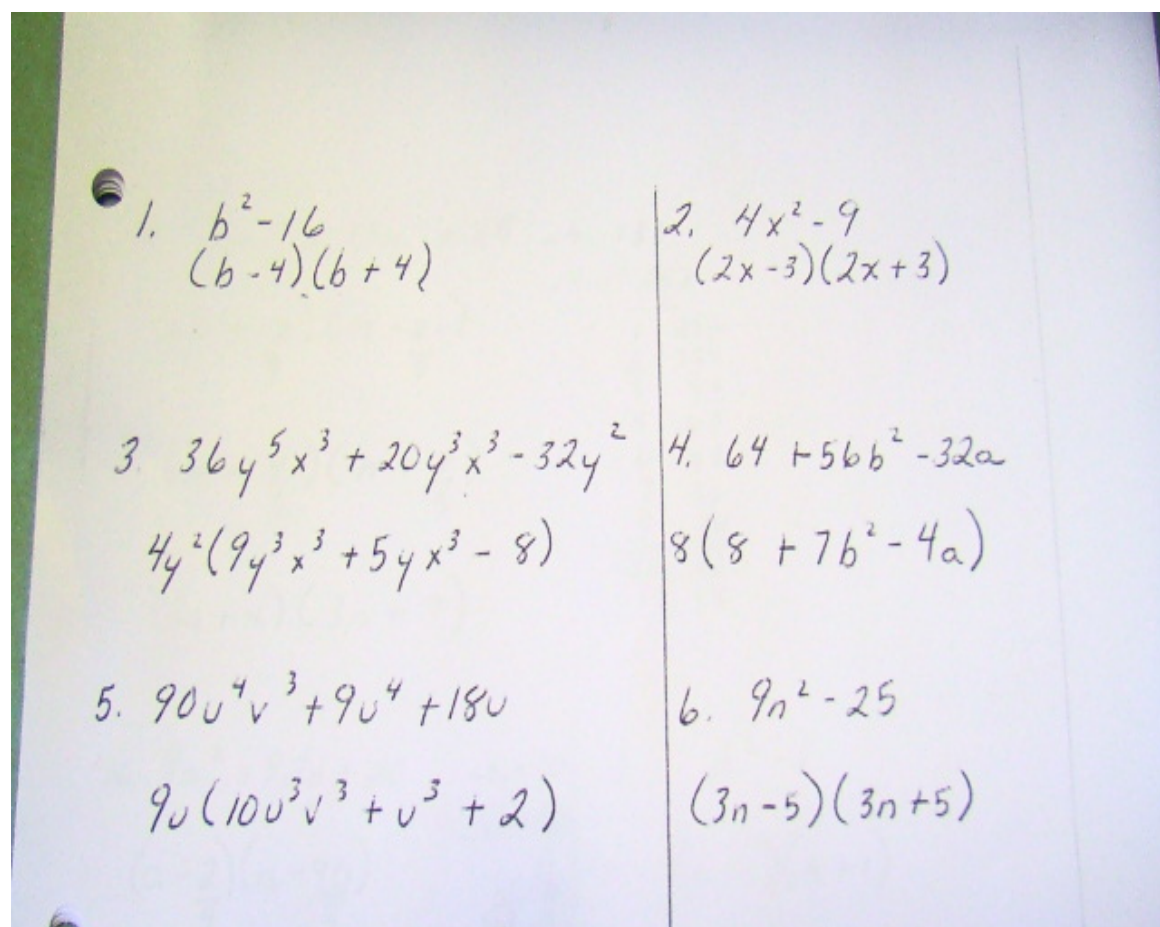
6. $\underline{4x^2} - \underline{49}$

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

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

$$\sqrt{49} = 7$$

Homework



A photograph of a notebook page with handwritten mathematical problems and their solutions. The page is divided into two columns by a vertical line. The problems are numbered 1 through 6. Each problem shows the original 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. $9n^2 + 33n + 28$ $-+ = 33$
 $-x = 252$

$(n+12)$	$(n+21)$	1	252
$\frac{9}{9}$	$\frac{9}{9}$	2	126
		3	84
		4	63
		6	42
		7	36
		9	28
		<u>12</u>	<u>21</u>
		14	18

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

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

11. $9a^2 - 92a + 20$ $-+ = -92$
 $-x = 180$

$(a-2)$	$(a-90)$	-1	-180
$\frac{9}{9}$	$\frac{9}{9}$	<u>-2</u>	<u>-90</u>
		-3	-60
		-4	-45
		-5	-36
		-6	-30
		-9	-20
		-10	-18
		-12	-15

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

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. $9 - 45b + 45ab$ $9(1 - 5b + 5ab)$ \uparrow <u>important</u>

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

18. $63g^6p^5r^2 + 21g^5p^4 + 28g^3$
 $7g^3(9g^3p^5r^2 + 3g^2p^4 + 4)$

19. $K^2 - 16$
 $(K-4)(K+4)$

20. $4p^2 + 12p + 9$ $-t = 12$
 $(p + \frac{6}{4})(p + \frac{6}{4})$ $-x = 36$
 $(p + \frac{3}{2})(p + \frac{3}{2})$ $\begin{array}{r} 1 \\ 1\ 36 \\ 3\ 12 \\ 4\ 9 \\ \hline 6\ 6 \end{array}$
 $(2p+3)(2p+3)$
 OR
 $(2p+3)^2$

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

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.

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

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