(Lessons 8-1 through 8-5)

Part I *Write the letter for the correct answer in the blank at the right of each question.*

1. Find $(x^3 - x + 1) - (3x - 1)$. $x^3 - x + 1 - 3x + 1$

2. Simplify $3a(a^2 - 3a + 4) - 4(3a^3 - 2a^2)$.

3. Find $(2a - 3b)^2$.

4. Find $(2x + 11)(3x - 7)$.

5. Factor $15g^3h^2 - 35g^2h + 40g$. GCF $5g$

6. Solve $4x^2 - 3x = 0$. $x(4x - 3) = 0$, $x = 0$

1. $x^3 - 4x + 2$

2. _____

3. $6x^2 + 19x - 77$

4. _____

5. $(3g^2h - 7gh + 8)$

6. $x = 0, 3/4$

7. Factor $75b^2c^3 + 60bc^6 - 35b^2c^4$ completely.

GCF: $5bc^3$

$5bc^3(15b + 12c^3 - 7bc)$

Part II

8. Factor the monomial $-70a^2b^2c$ completely.

$-1 \cdot 7 \cdot 2 \cdot 5 \cdot a \cdot a \cdot b \cdot b \cdot c$

9. **FALL** Diego drops his camera as he climbs a hill and it falls to the ground 256 feet below. The distance d that the camera falls in t seconds is given by the equation $d = 16t^2$. How long does it take the camera to hit the ground?

$256 = 16t^2$

$16 = t^2$

$t = 4$

Factor each polynomial.

10. $36xy^2 - 48x^2y$

11. $2xy - x + 4y - 2$

$(2xy - x) + (4y - 2)$

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

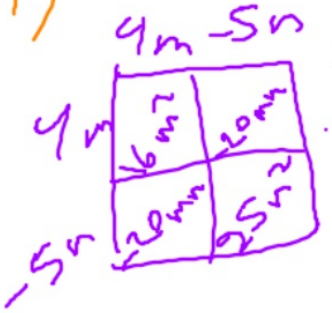
$(x + 2)(2y - 1)$

Simplify each expression.

12. $(3g^3 - 2g^2 - 2) - (4g^2 - g - 3)$

13. $(3y - 4)(2y + 5)$

14. $(4m - 5n)^2$



7. _____

8. _____

9. _____

10. _____

11. $(x + 2)(2y - 1)$

12. _____

13. _____

14. $16m^2 - 40mn + 25n^2$

"GCF"

5. Factor $15g^3h^2 - 35g^2h + 40g$.

GCF 5g

4. _____

5. _____

$(3g^2h^2 - 7gh + 8)$

5g

"Factor by grouping"

11. $2xy - x + 4y - 2$

$(2xy - x) + (4y - 2)$

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

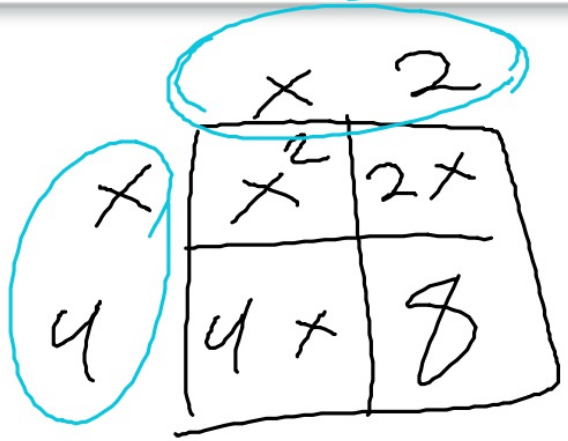
$(x + 2)(2y - 1)$.

We did factor for both... AND both can be reversed by distributing!

LESSON 8–6 Solving $x^2 + bx + c = 0$

KeyConcept Factoring $x^2 + bx + c$

Words	To factor trinomials in the form $x^2 + bx + c$, find two integers, m and p, with a sum of b and a product of c. Then write $x^2 + bx + c$ as $(x + m)(x + p)$.
Symbols	$x^2 + bx + c = (x + m)(x + p)$ when $m + p = b$ and $mp = c$.
Example	$x^2 + 6x + 8 = (x + 2)(x + 4)$ because $2 + 4 = 6$ and $2 \cdot 4 = 8$.



This will be an important pattern to remember for this section.

$(x+2)(x+4)$ Check:

$x^2 + 4x + 2x + 8$

Look at the following example.

$$(x + 4)(x + 7)$$

$$x^2 + 4x + 7x + 28$$

$$x^2 + 11x + 28$$

$(x + 4)(x + 7)$

What do you notice in red?

$x^2 + 4x + 7x + 28$

SO then I add...

$x^2 + 11x + 28$

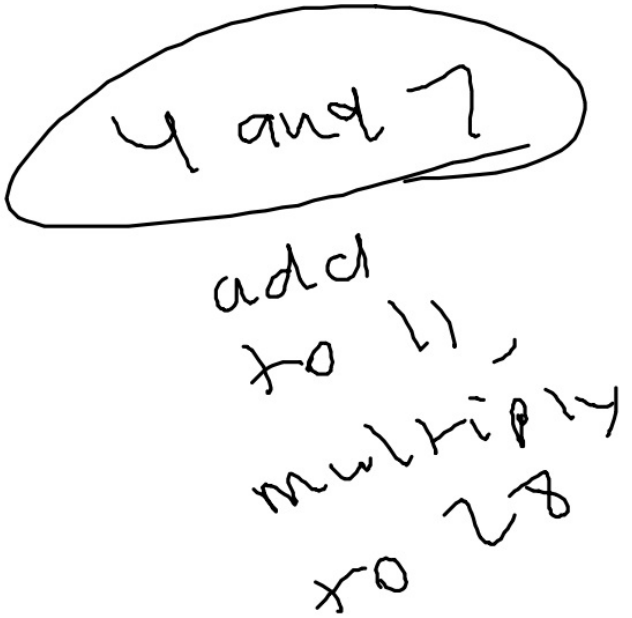
$(x + 4)(x + 7)$

What do you notice in green?

$x^2 + 4x + 7x + 28$

So they multiply

$x^2 + 11x + 28$



$$(x + 4)(x + 7)$$

$$x^2 + 4x + 7x + 28$$

$$x^2 + 11x + 28$$

Now, describe the relationship between the red and green.

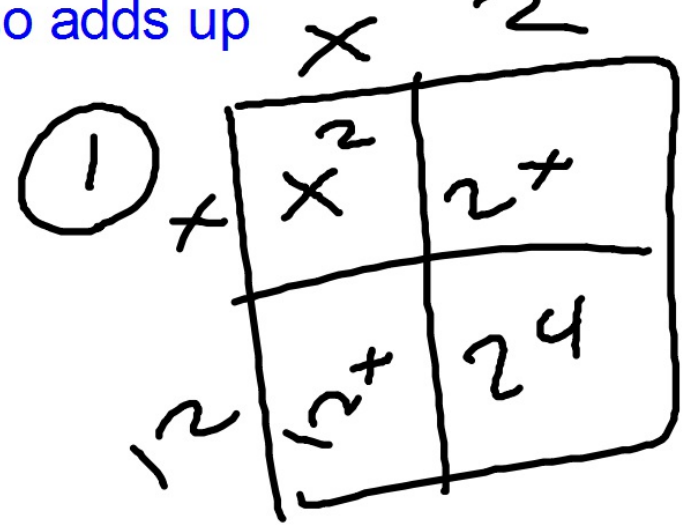
Examples 1–3 Factor each polynomial. Confirm your answers using a graphing calculator.

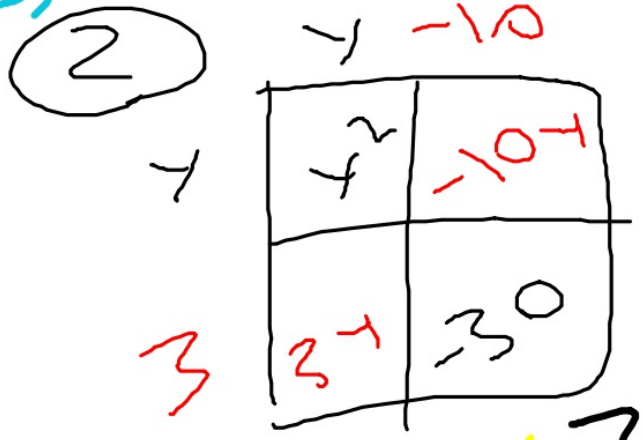
1. $x^2 + 14x + 24$ $(x+2)(x+12)$
2. $y^2 - 7y - 30$ $(y-10)(y+3)$
3. $n^2 + 4n - 21$ $(n+7)(n-3)$
4. $m^2 - 15m + 50$ $(m-5)(m-10)$

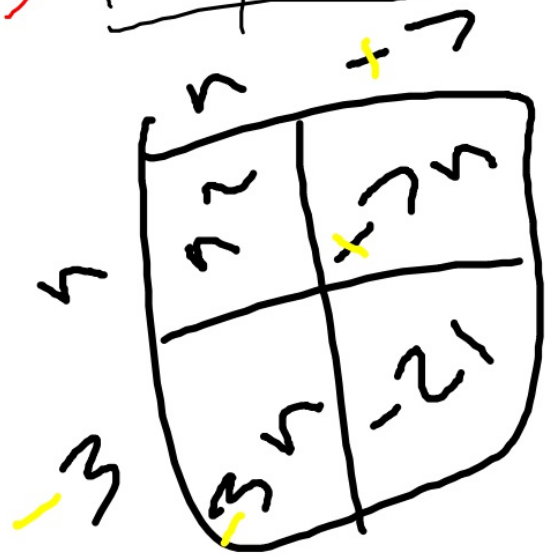
$x^2+2x+12x+24$

$x(x+2)+12(x+2)$

look at #1...think "what two numbers multiply to 24 that also adds up to 14?"







Example 4 **Solve each equation. Check your solutions.**

5. $x^2 - 4x - 21 = 0$

6. $n^2 - 3n + 2 = 0$

7. $x^2 - 15x + 54 = 0$

8. $x^2 + 12x = -32$

9. $x^2 - x - 72 = 0$

10. $x^2 - 10x = -24$

1) factor

2) zero product property!

7. $x^2 - 15x + 54 = 0$

Examples 1–3 Factor each polynomial. Confirm your answers using a graphing calculator.

13. $y^2 - 17y + 72$

15. $n^2 - 2n - 35$

17. $40 - 22x + x^2$

19. $-42 - m + m^2$

Example 4 **Solve each equation. Check your solutions.**

21 $y^2 + y = 20$

23. $a^2 + 11a = -18$

25. $x^2 - 18x = -32$

27. $d^2 + 56 = -18d$

29. $h^2 + 48 = 16h$