

Warm Up:

What constant would make the expression a trinomial square?

$$x^2 + 8x + \dots? \quad 16$$

The area of a square is $x^2 - 20x + c$. Find c . What is the side length of the square?

$$(x-10)^2$$

$$x-10$$

9. $(h + 4)^2$

10. $(v - 5)^2$

11. $(d - 10)^2$

12. $(m + 9)^2$

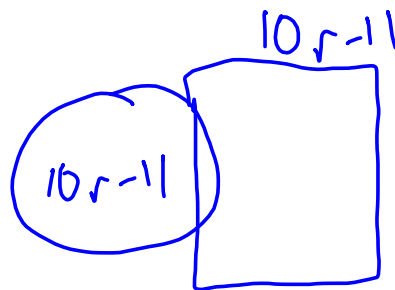
21. $10r - 11$

28. $(k + 8)(k - 8)$

29. $(m + 15)(m - 15)$

30. $(2p + 7)(2p - 7)$

31. $(9r + 1)(9r - 1)$



Factoring by Grouping

Sometimes when we have more than 3 terms, we can group terms together that have similar factors.

4 terms!



$$8r^3 + r^2 - 64r^2 - 8$$

$$r(8r^2 + 1) - 8(8r^2 + 1)$$

$$(r - 8)(8r^2 + 1)$$



$$6ar+10a-21br-35b$$

$$2a(3r+5) - 7b(3r+5)$$

$$(2a-7b)(3r+5)$$

$$x^2+2x+xy+2y$$

$$x(x+2)+y(x+2)$$

$$(x+y)(x+2)$$

$$15x^2 - 6ax - 20cx + 8ac$$

$$3x(5x - 2a) - 4c(5x - 2a)$$

$$(3x - 4c)(5x - 2a)$$

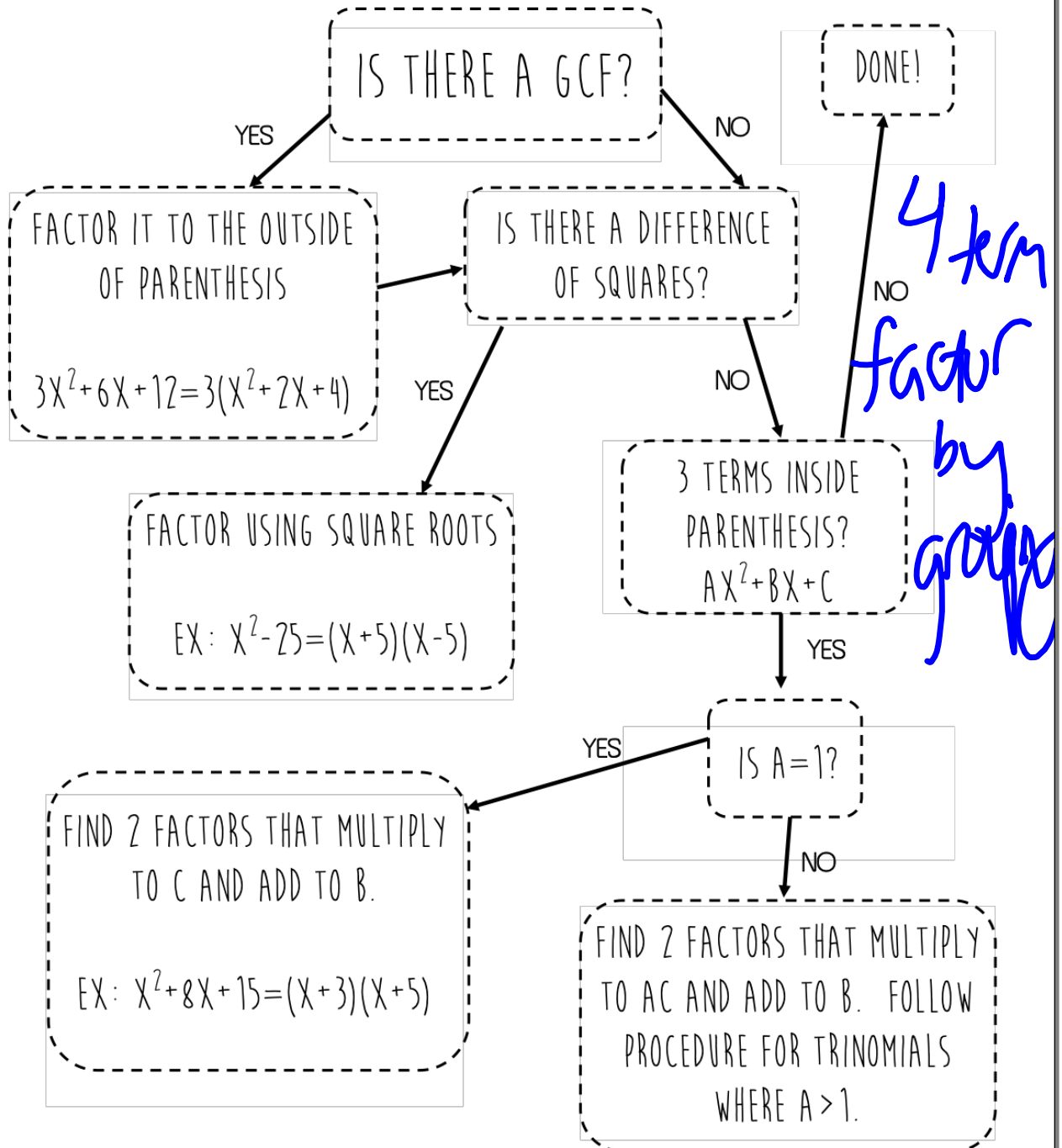
$$x^3 - 5x^2 - 9x + 45$$

$$x^2(x - 5) - 9(x - 5)$$

$$(x^2 - 9)(x - 5)$$

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

FACTORING QUADRATICS FLOWCHART



Practice sheet

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Name _____

Factoring By Grouping

Date _____ Period _____

Factor each completely.

1) $8r^3 - 64r^2 + r - 8$

2) $12p^3 - 21p^2 + 28p - 49$

3) $12x^3 + 2x^2 - 30x - 5$

4) $6v^3 - 16v^2 + 21v - 56$

5) $63n^3 + 54n^2 - 105n - 90$

6) $21k^3 - 84k^2 + 15k - 60$

7) $25v^3 + 5v^2 + 30v + 6$

8) $105n^3 + 175n^2 - 75n - 125$

9) $96n^3 - 84n^2 + 112n - 98$

10) $28v^3 + 16v^2 - 21v - 12$

11) $4v^3 - 12v^2 - 5v + 15$

12) $49x^3 - 35x^2 + 56x - 40$

13) $24p^3 + 15p^2 - 56p - 35$

14) $24r^3 - 64r^2 - 21r + 56$

15) $56xw + 49xk^2 - 24yw - 21yk^2$

16) $42mc + 36md - 7n^2c - 6n^2d$

17) $12x^2u + 3x^2v + 28yu + 7yv$

18) $40ac^2 + 25ak^2 + 32bc^2 + 20bk^2$

19) $12bc - 4bd - 15xc + 5xd$

20) $16mn - 4m^2 + 28n - 7m$

21) $56xy - 35x + 16ry - 10r$

22) $21xy + 15x + 35ry + 25r$

23) $5a^2z - 4a^2c + 15xz - 12xc$

24) $4xy + 6 - x - 24y$

25) $21xy - 12b^2 + 14xb - 18by$

26) $9mz - 4nc + 3mc - 12nz$

27) $28xy + 25 + 35x + 20y$

28) $30uv + 30u + 36u^2 + 25v$

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Name _____

Factoring By Grouping

Date _____ Period _____

Factor each completely.

$$1) 8r^3 - 64r^2 + r - 8$$

$$(8r^2 + 1)(r - 8)$$

$$2) 12p^3 - 21p^2 + 28p - 49$$

$$(3p^2 + 7)(4p - 7)$$

$$3) 12x^3 + 2x^2 - 30x - 5$$

$$(2x^2 - 5)(6x + 1)$$

$$4) 6v^3 - 16v^2 + 21v - 56$$

$$(2v^2 + 7)(3v - 8)$$

$$5) 63n^3 + 54n^2 - 105n - 90$$

$$3(3n^2 - 5)(7n + 6)$$

$$6) 21k^3 - 84k^2 + 15k - 60$$

$$3(7k^2 + 5)(k - 4)$$

$$7) 25v^3 + 5v^2 + 30v + 6$$

$$(5v^2 + 6)(5v + 1)$$

$$8) 105n^3 + 175n^2 - 75n - 125$$

$$5(7n^2 - 5)(3n + 5)$$

$$9) 96n^3 - 84n^2 + 112n - 98$$

$$2(6n^2 + 7)(8n - 7)$$

$$10) 28v^3 + 16v^2 - 21v - 12$$

$$(4v^2 - 3)(7v + 4)$$

$$11) 4v^3 - 12v^2 - 5v + 15$$

$$(4v^2 - 5)(v - 3)$$

$$12) 49x^3 - 35x^2 + 56x - 40$$

$$(7x^2 + 8)(7x - 5)$$

$$13) 24p^3 + 15p^2 - 56p - 35$$

$$(3p^2 - 7)(8p + 5)$$

$$14) 24r^3 - 64r^2 - 21r + 56$$

$$(8r^2 - 7)(3r - 8)$$

$$15) 56xw + 49xk^2 - 24yw - 21yk^2$$

$$(7x - 3y)(8w + 7k^2)$$

$$16) 42mc + 36md - 7n^2c - 6n^2d$$

$$(6m - n^2)(7c + 6d)$$

$$17) 12x^2u + 3x^2v + 28yu + 7yv$$

$$(3x^2 + 7y)(4u + v)$$

$$18) 40ac^2 + 25ak^2 + 32bc^2 + 20bk^2$$

$$(5a + 4b)(8c^2 + 5k^2)$$

$$19) 12bc - 4bd - 15xc + 5xd$$

$$(4b - 5x)(3c - d)$$

$$20) 16mn - 4m^2 + 28n - 7m$$

$$(4m + 7)(4n - m)$$

$$21) 56xy - 35x + 16ry - 10r$$

$$(7x + 2r)(8y - 5)$$

$$22) 21xy + 15x + 35ry + 25r$$

$$(3x + 5r)(7y + 5)$$

$$23) 5a^2z - 4a^2c + 15xz - 12xc$$

$$(a^2 + 3x)(5z - 4c)$$

$$24) 4xy + 6 - x - 24y$$

$$(x - 6)(4y - 1)$$

$$25) 21xy - 12b^2 + 14xb - 18by$$

$$(7x - 6b)(3y + 2b)$$

$$26) 9mz - 4nc + 3mc - 12nz$$

$$(3m - 4n)(3z + c)$$

$$27) 28xy + 25 + 35x + 20y$$

$$(7x + 5)(4y + 5)$$

$$28) 30uv + 30u + 36u^2 + 25v$$

$$(6u + 5)(5v + 6u)$$

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