

Notice Anything?



GCF (Greatest common factor)

$$44 \rightarrow \underline{2} \times \underline{2} \times \underline{11}$$

$$132 \rightarrow \underline{2} \times \underline{2} \times 3 \times \underline{11}$$

$$\text{GCF} = 2 \times 2 \times 11 = 44$$

What is the Greatest Common Factor?

$$856x^2y^3 \quad \text{AND} \quad 1200x^4y^2$$

Anything Common?

3 terms
They all have a "x"

$$3x + 10xy - 7xyz$$

$$3x \rightarrow 3 \cdot \textcircled{x}$$

$$10xy \rightarrow 2 \cdot 5 \cdot \textcircled{x} \cdot y$$

$$7xyz \rightarrow 7 \cdot \textcircled{x} \cdot y \cdot z$$

$$\text{GCF} = x$$

Remember

$$3x + 10xy - 7xyz$$

$$3x \rightarrow 3 \cdot x$$

$$10xy \rightarrow 2 \cdot 5 \cdot x \cdot y$$

$$7xyz \rightarrow 7 \cdot x \cdot y \cdot z$$

$$\underline{3x} + \underline{10xy} - \underline{7xyz}$$

$$\underline{x}(3 + 10y - 7yz)$$



We need to factor out an "x".

Divide each term by x:

$$\frac{3x}{x} = 3x^{1-1} = 3x^0 = 3$$

$$\frac{10xy}{x} = 10y$$

$$\frac{-7xyz}{x} = -7yz$$

What do you notice?

$$x^6 + x^5$$

2 terms

common factor of x^5

$$x^6 + x^5$$

The diagram shows the expansion of x^6 and x^5 into their prime factors. x^6 is written as $x \cdot x \cdot x \cdot x \cdot x \cdot x$ with the first five x 's circled in red. x^5 is written as $x \cdot x \cdot x \cdot x \cdot x$ with all five x 's circled in red. Below these, the common factor $x \cdot x \cdot x \cdot x \cdot x = x^5$ is circled in blue, with an arrow pointing to it from the label "GCF".

Take out the greatest common factor, which will be the smallest of the like powers!!

$$\begin{aligned}
 & x^6 + x^5 \\
 &= x^5(x^1 + 1) \\
 &= x^5(x + 1)
 \end{aligned}$$

Divide each term by x^5

$$\begin{aligned}
 \frac{x^6}{x^5} &= x^{6-5} = x^1 \\
 \frac{x^5}{x^5} &= x^{5-5} = x^0 = 1
 \end{aligned}$$

$$14xy + 28xyz$$

$$\begin{array}{l}
 14 = 2 \cdot 7 \cdot x \cdot y \\
 28 = 2 \cdot 2 \cdot 7 \cdot x \cdot y \cdot z \\
 \underline{2} \cdot \underline{7} \cdot \underline{x} \cdot \underline{y} = 14xy
 \end{array}$$

$$\begin{aligned}
 &14xy + 28xyz \\
 &= 14xy(1 + 2z) \\
 &= 14xy(1 + 2z)
 \end{aligned}$$

Divide each term
by $14xy$

$$\frac{14xy}{14xy} = 1$$

$$\frac{28xyz}{14xy} = 2z$$

$$1. \quad a^5c^6z^{11} + a^9c^{10}z^{13}$$

$$\boxed{a^5c^6z^{11} (1 + a^4c^4z^2)}$$

* lowest exponent

$$\frac{a^5c^6z^{11}}{a^5c^6z^{11}} = 1$$

$$\frac{a^9c^{10}z^{13}}{a^5c^6z^{11}} = a^4c^4z^2$$

$$2. \quad 25x^7 - 15x^5$$

$$25x^7 \rightarrow 5 \cdot 5 \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x$$

$$15x^5 \rightarrow 3 \cdot 5 \cdot x \cdot x \cdot x \cdot x \cdot x$$

$$\text{GCF} = 5x^5$$

$$25x^7 - 15x^5$$

$$\boxed{= 5x^5(5x^2 - 3)}$$

$$3. \quad 12x^7y^8 - 24x^9y^4 \quad \text{GCF} = 12x^7y^4$$
$$12x^7y^4(y^4 - 2x^2)$$

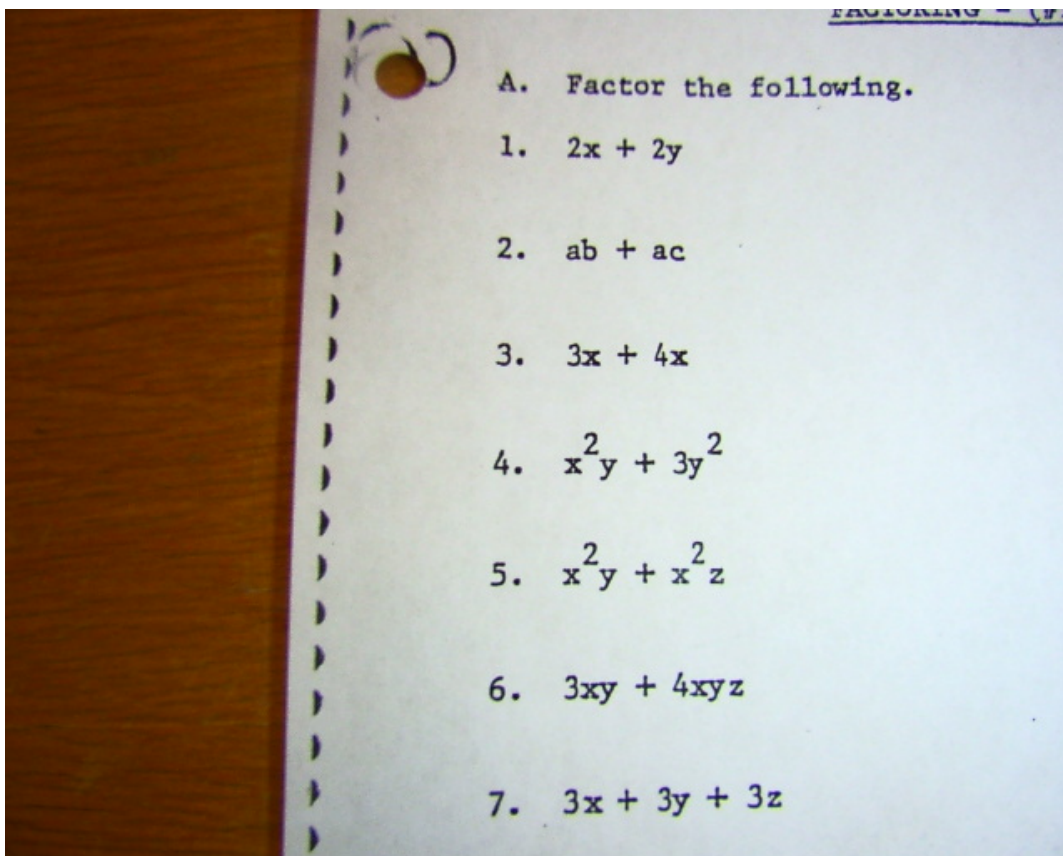
$$4. \quad 13x^2y^5w^3 - 39x^5y^2w + 26x^3y$$
$$13x^2y(y^4w^3 - 3x^3yw + 2x) \quad \text{GCF} = 13x^2y$$

$$5. \quad 91x - 7y \quad \text{GCF} = 7$$

$$7(13x - y)$$

$$6. \quad 2x^5y^3 - 8x^2y^2 + 10y \quad \text{GCF} = 2y$$

$$2y(x^5y^2 - 4x^2y + 5)$$



8. $15y^2 + 20a + 30b$

9. $4x + 6a$

10. $10y - 5$

11. $15ax - 3a$

12. $a^3x^2 - a^2x^2 - qx$

13. $14y^4 - 35y^3 - 42y^2$

14. $12y^4 + 18y^6$

15. $-6x^8 + 9$

12. $a^3x^2 - a^2x^2 - qx$

13. $14y^4 - 35y^3 - 42y^2$

14. $12y^4 + 18y^6$

15. $-6x^8 + 9$

16. $2ax - 2bx - 2cx$

17. $-9x^3 + 33x^2 - 6x + 12$

18. $-100x^4 - 1000x^3 - 10\,000x$

19. $2x^3 - 10x^2 + 12x$

20. $4y^3 + 8y^2 - 4y$

21. $8x^2 - 24x + 96$

22. $-63y^5 + 15y^3 - 27y^2 + 45y$

23. $-10ey^5 - 30e^2y^2 + 45ey - 15e$

24. $36a^7x^4 - 42a^9x^2$

25. $4y^3 - 2ay^2$

26. $-3y^4 - 6y^3 + 21y^2$

27. $4x^2 - 2x + 12$

28. $3x^3 - 9x^2 + 6x$

29. $30y^4 - 18y^3 - 6y^2$

30. $7x - 28$

31. $42a^2b^2 + 7ab + 6b$

32. $3x^2 + 12x + 9$

33. $100 - 1000x$

29. $30y^4 - 18y^3 - 6y^2$

30. $7x - 28$

31. $42a^2b^2 + 7ab + 6b$

32. $3x^2 + 12x + 9$

33. $100 - 1000x$

34. $44a - 33b + 22c$

35. $4ab^2 - ab^2c$