

**Essential Question: What does it mean to factor completely?**

**Do Now:**

a. Factor by factoring out the *GCF*.

$$4x^3 - 4x^2 - 80x$$

b. Factor into two binomials.

$$x^2 - x - 20$$



**What does it mean to factor completely?**

**Factoring a Polynomial "completely" means....**

- We can write the polynomial as a product of a monomial and one or more polynomial factors or two or more polynomial factors
- Polynomial factors
  - have integer coefficients
  - are "prime polynomials" because its terms do not have common factors

**Example:** Factor  $4x^3 - 4x^2 - 80x$  completely.

**When factoring completely...make sure to**

- 1) Factor out the *GCF* **FIRST!**
- 2) Factor using *DOTS* (if you have a binomial factor) or *AM* method (if you have a trinomial factor)

**Examples: Factor Completely**

1.  $4x^2 + 8x - 320$

2.  $3x^2 + 15x + 18$

3.  $2x^3 - 22x^2 + 60x$

4.  $ax^2 - 16a$

5.  $100y^6 - x^2y^4$

6.  $32 - 18z^4$

7.  $ax^2 + 2ax + 11a$

8.  $4x^2 - 36xy + 56y^2$

9.  $98 - 2a^2$

10.  $3x^2 + 39x + 108$

11.  $2y^2 - 9$

12.  $y^4 - 16$

13.  $4x^2 + 16$

14.  $m^3n - mn^3$

15.  $-4x^2 - 12x + 16$

16.  $2x^4 - 4x^2 - 16$

**Factor Completely.**

1.  $4x^2 - 20z^2$

11.  $2x^3 - 18x^2 + 28x$

2.  $a^2b - 25b^2$

12.  $x^2 + 36$

3.  $15x^2y^2 - 60z^2$

13.  $3b^2 - 147$

4.  $ax^2 - 2ax - 35a$

14.  $3m^2n + 6mn + 9mn^2$

5.  $x^2 - 7x + 10$

15.  $-24y^4 + 54x^2$

6.  $6x^2 - 24$

16.  $16x + x^2 - 80$

7.  $4x^3 - 144x$

17.  $x^2 + 8x - 36$

8.  $5x^3 + 30x^2 - 40x$

18.  $3x^4 - 48$

9.  $-x^2 - 4x + 32$

19.  $16x^2 - 16y^2$

10.  $3x^2 + 12x + 9$

20.  $2x^4 - 18$

*Turn Over* →

$$21. -9 + y^4$$

$$32. y - y^3$$

$$22. 49 - 64x^2$$

$$33. 2y^2 - 9$$

$$23. 25z^4 - 1$$

$$34. 4x^2 + 4y^2$$

$$24. 100c^4 - 16d^2$$

$$35. (c + d)^2 - a^2$$

$$25. x^2y^2 - w^2z^2$$

$$26. 27y^4 - 3x^4$$

$$27. 100y^6 - x^2y^4$$

$$28. 4x^4 + 16$$

$$29. 32 - 18z^4$$

$$30. 60x^2 - 15x^4y^4$$

$$31. 98 - 2a^2$$