

FACTOR FEST WS ANSWERS (PART 1)

1. $2(x-5) + 3a(x-5)$
 $(x-5)(2+3a)$

2. $81x^2 - 16$
 $(9x-4)(9x+4)$

3. $32x^{12} + 108x^9 - 8x^{10} - 27x^7$
 $x^7(32x^5 + 108x^2 - 8x^3 - 27)$
 $x^7(32x^5 - 8x^3 + 108x^2 - 27)$
 $x^7[8x^3(4x^2-1) + 27(4x^2-1)]$
 $x^7(8x^3+27)(4x^2-1)$
 $x^7(2x+3)(4x^2-6x+9)(2x-1)(2x+1)$

4. $y^7 - y^5$
 $y^5(y^2-1)$
 $y^5(y-1)(y+1)$

9. $(40abx - 24abxy - 35c^2x + 21c^2xy)$
 $8abx(5-3y) - 7c^2x(5-3y)$
 $(8abx - 7c^2x)(5-3y)$
 $x(8ab - 7c^2)(5-3y)$

5. $18x^4 + 21x^3 + 6x^2$
 $3x^2(6x^2 + 7x + 2)$
 $3x^2(3x+2)(2x+1)$

10. $(x+y)^3 + 125$
 $(x+y+5)(x+y)^2 - 5(x+y) + 25$
 $(x+y+5)(x^2+2xy+y^2-5x-5y+25)$

6. $72xy^4 - 24xy^2z + 2xz^2$
 $2x(36y^4 - 12y^2z + z^2)$
 $2x(6y^2 - z)^2$

11. $25x^4 + 16$
↑ PRIME!

7. $8a^2b^3 - 12ab^4$
 $4ab^3(2a-3b)$

12. $64y^3 + 125$
 $(4y+5)(16y^2-20y+25)$

8. $2x^6 - 5x^3 + 3$
 $(2x^3-3)(x^3-1)$
 $(2x^3-3)(x-1)(x^2+x+1)$

13. $6x^2 - x - 12$
 $(3x+4)(2x-3)$

$$14. \quad 3x^6y^2 + 81y^2$$

$$3y^2(x^6 + 27)$$

$$3y^2(x^2 + 3)(x^4 - 3x^2 + 9)$$

$$15. \quad 16x^4y - y$$

$$y(16x^4 - 1)$$

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

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

$$16. \quad (3x^3 - 2x^2 - 12x + 8)$$

$$x^2(3x - 2) - 4(3x - 2)$$

$$(3x - 2)(x^2 - 4)$$

$$(3x - 2)(x + 2)(x - 2)$$

$$17. \quad 12x^4 - 19x^2 - 18$$

$$(4x^2 - 9)(3x^2 + 2)$$

$$(2x - 3)(2x + 3)(3x^2 + 2)$$

$$18. \quad (4x + 2)^3 - 125$$

$$(4x + 2 - 5)((4x + 2)^2 + 5(4x + 2) + 25)$$

$$(4x - 3)(16x^2 + 16x + 4 + 20x + 10 + 25)$$

$$(4x - 3)(16x^2 + 36x + 39)$$

$$19. \quad 3c^2 + 8c - 4 \qquad 8^2 - 4(3)(-4)$$

$$\text{PRIME!} \qquad 64 + 48$$

$$112 \leftarrow \text{not a perfect sq or zero}$$

$$20. \quad 27x^2 - 12x + 18$$

$$3(9x^2 - 4x + 6)$$

$$\text{prime!} \qquad (-4)^2 - 4(9)(6)$$

$$16 - 216$$

$$-200 \leftarrow \text{not a perfect sq or zero}$$

FACTORFEST (PART 2)

1. $40x^8y^6 - 16x^9y^5$

$$8x^8y^5(5y - 2x)$$

2. $121x^2 - 25$

$$(11x - 5)(11x + 5)$$

3. $(x^3 + 3x^2) + (x + 3)$

$$x^2(x + 3) + 1(x + 3)$$

$$(x + 3)(x^2 + 1)$$

4. $x^9 - x^5$

$$x^5(x^4 - 1)$$

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

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

5. $x^6 - 3x^3 - 18$

$$(x^3 - 6)(x^3 + 3)$$

6. $6y^6 - 11y^3 - 10$

$$(3y^3 + 2)(2y^3 - 5)$$

7. $40a^{20}b^{30} - 90a^{22}b^{26}$

$$10a^{20}b^{26}(4b^4 - 9a^2)$$
$$10a^{20}b^{26}(2b^2 - 3a)(2b^2 + 3a)$$

8. $8x^3 - 27$

$(2x-3)(4x^2+6x+9)$

9. $(5x^2 - 20x^2y) + (5z - 20yz)$

$5x^2(1-4y) + 5z(1-4y)$

$(1-4y)(5x^2+5z)$ - GCF!

$5(1-4y)(x^2+z)$

10. $25x^4z + 15x^3z + 5x^2z$

$5x^2z(5x^2+3x+1)$

11. $49x^4 + 25$

PRIME!

12. $27y^3 + 216$

$27(y^3+8)$

$27(y+2)(y^2-2y+4)$

13. $5x^2 + 8x - 6$

$(5x - \cancel{x+6})(x+1)$

PRIME

$(8)^2 - 4(5)(-6)$

$64 + 120$

184

14. $8y^2 + 5 - 22y$

$8y^2 - 22y + 5$

$(4y-1)(2y-5)$

15. $81x^4yz - yz$

$yz(81x^4-1)$

$yz(9x^2-1)(9x^2+1)$

$yz(3x-1)(3x+1)(9x^2+1)$

$$16. \quad 9y^3 - 6y^2 - 36y + 24$$

$$3(3y^3 - 2y^2 - 12y + 8)$$

$$3[y^2(3y-2) - 4(3y-2)]$$

$$3(3y-2)(y^2-4)$$

$$3(3y-2)(y+2)(y-2)$$

$$17. \quad 20x^2 - 58x - 34$$

$$2(10x^2 - 29x - 17)$$

$$2(5x-17)(2x+1)$$

$$18. \quad 36w^4 - 23w^2 - 3$$

$$(4w^2-3)(9w^2+1)$$

$$19. \quad (x^2-6)^3 + 27$$

$$(x^2-6+3)(x^2-6)^2 - 3(x^2-6)+9$$

$$(x^2-3)(x^4-12x^2+36-3x^2+18+9)$$

$$(x^2-3)(x^4-15x^2+63)$$

$$20. \quad 3x^6 - 23x^3 - 8$$

$$(3x^3+1)(x^3-8)$$

$$(3x^3+1)(x-2)(x^2+2x+4)$$

