Factoring Polynomials Study Guide 2019

Factor each polynomial completely. <u>You must show ALL work to earn ALL credit.</u>

1. $\dfrac{24x^2}{6} - \dfrac{54y^2}{6}$ $6(4x^2 - 9y^2)$ $6(2x+3y)(2x-3y)$	2. $3x^5 - 39x^4 + 90x^3$ $3x^3(x^2 - 13x + 30)$ $3x^3(x-3)(x-10)$
3. $\dfrac{14a^2b^2}{7ab} + \dfrac{35ab}{7ab} - \dfrac{21a^4b^3}{7ab}$ $7ab(2ab + 5 - 3a^3b^2)$	4. $8n^2 - 36n + 40$ $4(2n^2 - 9n + 10)$ $(2n^2 - 4n)(-5n + 10)$ $2n(n-2) - 5(n-2)$ $4(2n-5)(n-2)$
5. $\left(2a^2 - 4a\right)\left(+\ a - 2\right)$ $2a(a-2) + 1(a-2)$ $(2a+1)(a-2)$	6. $3x^2 + 27x + 45$ $3(x^2 + 9x + 15)$
7. $z^2 + 8z + 16$ $(z+4)^2$	8. $5x^2 + 45x + 40$ $5(x^2 + 9x + 8)$ $5(x+8)(x+1)$
9. $3p^2 - 14p + 12$ prime	10. $\left(6p^3 + 15p^2 - 8p + 20\right)$ $3p^2(2p+5) - 4(2p-5)$ prime

Factor each polynomial completely.

11. $2x^2 + 7x + 5$ $(2x^2 + 2x)(+5x + 5)$ $2x(x+1) + 5(x+1)$ $(2x+5)(x+1)$	12. $24b + 14b^2 + 2b^3$ $2b(12 + 7b + b^2)$ $2b(b+4)(b+3)$
13. $16x^2 - 1$ $(4x+1)(4x-1)$	14. $4x^2 - 13x + 3$ $(4x^2 - 12x)(-x + 3)$ $4x(x-3) -1(x-3)$ $(4x-1)(x-3)$
15. Given the area, find the dimensions of each rectangle. $Area = x^2 + 22x + 40$ $L = x + 20$ $W = x + 2$	16. The length of a rectangular courtyard is given by the expression $3x - 2$. If the area is given by, $3x^2 + 4x - 4$, find the width of the room. $(3x^2 + 6x)(-2x - 4)$ $3x(x+2) - 2(x+2)$ $(3x-2)(x+2) = W$
17. __Factor each__ polynomial and __select all__ that are prime A. $8x^2 - 2x$ C. $x^2 + 1$ B. $5x^2 + 6x + 1$ D. $9x^2 - 81$ E. $9a^2 + 42a - 49$ (C and E circled; A, B, D crossed out)	18. Which binomial is a factor of $x^2 - 14x + 45$? A. $9 - x$ C. $x^2 + 9$ B. $x + 5$ D. $x - 5$ (D circled)
19. Explain the error in the following factorization: $x^2 + x - 20 = (x - 5)(x + 4)$	20. Which expression is equivalent to $t^2 - 144$? A. $(t + 12)(t - 12)$ B. $(t - 12)(t - 12)$ C. $(t - 36)(t - 4)$ D. $(t - 36)(t + 4)$ (A circled)