Variables and Expressions
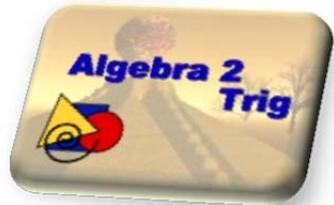
Name_____

1. Assuming values of n for which these expressions are defined, the expression $\left(1+\dfrac{1}{n}\right) \div \left(\dfrac{n+1}{n^2}\right)$ is equivalent to

    [1] $\dfrac{(n+1)^2}{n^3}$ [2] $\dfrac{2n}{n+1}$ [3] $\dfrac{n^2}{n+1}$ [4] n

     1._____

2. The sum $\dfrac{3}{x-3}+\dfrac{x}{3-x}$ is equivalent to

    [1] 1   [2] 0   [3] -1   [4] $\dfrac{x+3}{x-3}$

     2._____

3. The expression $\dfrac{6}{z-5}-\dfrac{z+5}{z^2-25}$ is equivalent to

    [1] $\dfrac{5}{z+5}$ [2] $\dfrac{5z}{z-5}$ [3] $\dfrac{5z}{z+5}$ [4] $\dfrac{5}{z-5}$

     3._____

4. The expression $\dfrac{\frac{3x}{x+3}}{\frac{x}{x^2-9}}$ is equivalent to

    [1] $3x - 9$ [2] $2x + 6$ [3] $3x$ [4] $\dfrac{3}{x+3}$

     4._____

5. The fraction $\dfrac{b+\frac{b}{a}}{a-\frac{1}{a}}$ is equivalent to

    [1] b [2] $\dfrac{b}{a-1}$ [3] $\dfrac{2ab}{a^2-1}$ [4] $\dfrac{a-1}{b}$

     5._____

6. Factor completely: $a^2 + ab + ac + bc$
    [1] $(a + b)(a + c)$ [2] $a(a + b + 2c)$ [3] $a(a + b + c) + b$ [4] $(a - c)(a - b)$

     6._____

7. Factor completely: $2x^2 - 18x - 72$
    [1] $2(x^2 - 9x - 36)$ [2] $2(x + 3)(x - 12)$ [3] $2(x - 3)(x + 12)$ [4] $-2(x + 3)(x - 12)$

     7._____

8. Factor completely: $3m^4 - 75$

[1] $3(m^2 + 5)(m^2 - 5)$ [3] $3(m^2 + 5)(m - 2)(m + 3)$

[2] $3m^2(m + 5)(m - 5)$ [4] $3(m^2 - 5)^2$

8._____

9. Factor completely: $x^8 - y^4$

[1] $(x^4 + y^2)(x^4 - y^2)$ [3] $(x^4 + y^2)(x^2 + y)(x^2 - y)$

[2] $(x^4 + y^2)(x^2 - y)(x^2 - y)$ [4] $(x^2 + y)(x^2 + y)(x^2 + y)(x^2 - y)$

9._____

10. Factor completely: $5x^2 - 20$

[1] $(5x - 4)(x + 5)$ [3] $(5x + 2)(x - 10)$

[2] $5(x - 1)(x + 4)$ [4] $5(x - 2)(x + 2)$

10._____

11. The sum of $(y - 5) + \dfrac{3}{y + 2}$ is

[1] $\dfrac{y^2 - 7}{y + 2}$ [2] $\dfrac{y - 2}{y + 2}$ [3] $\dfrac{y^2 - 3y - 7}{y + 2}$ [4] $y - 5$

11._____

12. The expression $\dfrac{2x}{x^2 - 4} \div \dfrac{4}{x^2 - 4x + 4} + \dfrac{12}{x^2 - 4} \bullet \dfrac{2 - x}{3}$ is equivalent to

[1] $\dfrac{x - 4}{2}$ [2] $\dfrac{x - 2}{4}$ [3] $\dfrac{x^2 - 2x + 8}{2x + 4}$ [4] $\dfrac{x^2 - 2x + 8}{2x - 4}$

12._____

13. Expressed as a single fraction, $\dfrac{1}{x + 1} + \dfrac{1}{x}$, $x \neq 0, -1$ is

[1] $\dfrac{3}{x^2}$ [2] $\dfrac{2x + 3}{x^2 + x}$ [3] $\dfrac{2x + 1}{x^2 + x}$ [4] $\dfrac{2}{2x + 1}$

13._____

14. In a science experiment, when resistors A and B are connected in a parallel circuit, the total resistance is $\dfrac{1}{\dfrac{1}{A} + \dfrac{1}{B}}$. This complex fraction is equivalent to

[1] 1 [2] $A + B$ [3] AB [4] $\dfrac{AB}{A + B}$

14._____

15. The equation $\dfrac{x - 2}{x + 7} \div \dfrac{x + 7}{x - 2} = 1$ is true for all rational values of x where x is not equal to

[1] 2 [2] -7 [3] 2 and -7 [4] -2 and 7

15._____

16. Factor completely: $6x^2 + 19x + 10$

[1] $(6x + 2)(x + 5)$ [3] $(3x + 2)(2x + 5)$

[2] $(6x + 5)(x + 2)$ [4] $(3x + 5)(2x + 2)$

16._____

17. The fraction $\dfrac{xy^{-1}+1}{2+x^{-1}}$ is equivalent to $\dfrac{1+xy}{y(2x+1)}$. (TRUE or FALSE)

[1] TRUE [2] FALSE

17._____

18. The expression $\dfrac{8y^3 - 16y^2}{2y^3 - 2y^2 - 4y}$ is equivalent to

[1] $\dfrac{2}{y(y+1)}$ [2] $\dfrac{2y}{(y+1)}$ [3] $\dfrac{4y}{(y+1)}$ [4] $\dfrac{4}{(y+1)}$

18._____

19. Find the domain of the following expression: $\dfrac{x-2}{x^2+9}$

[1] $x \neq \pm 3$ [2] $x \neq \pm 3$ and $x \neq 2$ [3] $x \neq -3$ [4] all x

19._____

20. The expression $\dfrac{a^4 - 81}{4a^2 + 9a - 9}$ is equivalent to

[1] $\dfrac{a-3}{(4a+3)}$ [2] $\dfrac{(a^2+9)(a-3)}{(4a+3)}$ [3] $\dfrac{(a^2+9)}{(4a-3)}$ [4] $\dfrac{(a^2+9)(a+3)}{(4a+3)}$

20._____