MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Perform the indicated operation and simplify.

1. $\frac{4x^2-25}{x^2-49} \div \frac{2x-5}{x+7}$

A. $\frac{2x-5}{x+7}$ B. $\frac{x-7}{2x+5}$

C. $\frac{2x+5}{x-7}$ D. $\frac{(2x-5)(4x^2-25)}{(x^2+7)(x+7)}$

2. $\frac{x}{x^2-16} - \frac{7}{x^2+5x+4}$

A. $\frac{x^2-6}{(x-4)(x+4)(x+1)}$ B. $\frac{x^2-6x+28}{(x-4)(x+4)}$

C. $\frac{x^2-6x+28}{(x-4)(x+4)(x+1)}$ D. $\frac{x^2+6x+28}{(x-4)(x+4)(x+1)}$

3. $-4(q^2-4q+3)+3(-4q^2+q-2)$

A. $-8q^2-13q+18$ B. $-16q^2-19q-18$ C. $-16q^2+19q-18$ D. $-16q^2-13q+18$

4. $(9x-4y)^2$

A. $9x^2+16y^2$ B. $9x^2-72xy+16y^2$

C. $81x^2+16y^2$ D. $81x^2-72xy+16y^2$

Factor completely. State that the polynomial is prime if it cannot be factored.

5. $24x^3-104x^2-80x$

A. $8x(3x+2)(x-5)$ B. $(x^2-5)(24x+16)$ C. $8(3x-2)(x+5)$ D. $x(3x+2)(8x-40)$

6. $9x^2+49$

A. $(3x+7)^2$ B. prime C. $(3x-7)^2$ D. $(3x+7)(3x-7)$

7. $27c^3 + 8$

A. $(3c + 2)(9c^2 - 6c + 4)$
B. $(3c - 2)(9c^2 + 6c + 4)$
C. $(3c + 2)(9c^2 + 4)$
D. $(27c + 2)(c^2 - 6c + 4)$

Write the expression in lowest terms.

8. $\frac{a^2 - 6a}{(a + 8)(a - 6)}$

A. $\frac{a^2}{a + 8}$
B. $\frac{1}{a + 8}$
C. $\frac{a}{a + 8}$
D. $\frac{a - 6}{a + 8}$

Solve the equation.

9. $\frac{1}{2}(4x - 8) = \frac{1}{3}(12x - 6)$

A. 1
B. –8
C. $\frac{1}{8}$
D. –1

Solve the equation. If the solutions involve square roots, give both the exact solutions and the approximate solutions to three decimal places

10. $2n^2 = -6n - 1$

A. $\frac{-6 + \sqrt{7}}{2} \approx -1.677, \frac{-6 - \sqrt{7}}{2} \approx -4.323$
B. $\frac{-3 + \sqrt{11}}{2} \approx 0.158, \frac{-3 - \sqrt{11}}{2} \approx -3.158$
C. $\frac{-3 + \sqrt{7}}{2} \approx -0.177, \frac{-3 - \sqrt{7}}{2} \approx -2.823$
D. $\frac{-3 + \sqrt{7}}{4} \approx -0.089, \frac{-3 - \sqrt{7}}{4} \approx -1.411$

11. $1 + \frac{1}{x} = \frac{6}{x^2}$

A. $-\frac{1}{3}, \frac{1}{2}$
B. –2, 3
C. –3, 2
D. 2, 3

12. $\frac{2}{t} = \frac{t}{-4t - 6}$

A. No solution
B. –6, –2
C. 0, 4
D. 0, $\frac{3}{2}$

Using the variable x, write the interval as an inequality.

13. $[-7, \infty)$

A. $x < -7$ B. $x \geq -7$ C. $x \leq -7$ D. $x > -7$

14. $(-3, 1]$

A. $-3 < x < 1$ B. $-3 < x \leq 1$ C. $x \leq 1$ D. $-3 \leq x \leq 1$

Evaluate the expression. Write your answer without exponents.

15. $(-2)^{-6}$

A. -64 B. $\frac{1}{64}$ C. $\frac{1}{-64}$ D. 64

16. $\frac{1}{-3^{-3}}$

A. 27 B. -9 C. 9 D. -27

17. $\left(\frac{27}{8}\right)^{-2/3}$

A. $-\frac{9}{4}$ B. $\frac{4}{9}$ C. $\frac{9}{4}$ D. $\frac{4}{27}$

Simplify the expression. If the expression contains any variabled, assume that they represent positive real numbers. Write your answer with only positive exponents.

18. $\left(\frac{x^{-3}y^2}{y^{-2}}\right)^{-2}$

A. $\frac{1}{x^6y^8}$ B. $\frac{x^6}{y^8}$ C. $\frac{y^8}{x^6}$ D. $\frac{x^6}{y^6}$

19. $\left(\frac{x}{3}\right)^{-3} + \left(\frac{y}{5}\right)^{-1}$

A. $\frac{27y + 5x}{xy}$ B. $\frac{135 + x^3y}{27y}$ C. $\frac{27y + 5x^3}{x^3y}$ D. $\frac{27y + 5x^3}{135}$

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Simplify. Assume that all variables represent positive real numbers.

20. $-\sqrt{252}$

A. $-36\sqrt{7}$ B. 6 C. $-6\sqrt{7}$ D. 15

21. $\sqrt[3]{729x^4y^5}$

A. $2xy(\sqrt[3]{xy^2})$ B. $9xy(\sqrt[2]{xy^2})$ C. $9xy(\sqrt[3]{xy})$ D. $9xy(\sqrt[3]{xy^2})$

22. $\sqrt[3]{y} \cdot \sqrt[5]{y^3}$

A. $\sqrt[8]{y^4}$ B. $\sqrt[15]{y^{14}}$ C. $\sqrt[8]{y^3}$ D. $\sqrt[15]{y^4}$

Perform the indicated operations and simplify. Assume all variables represent positive real numbers.

23. $5\sqrt[3]{a} + \sqrt[3]{64a}$

A. $9\sqrt[3]{a}$ B. $5\sqrt[3]{a} + \sqrt[3]{64a}$ C. $20\sqrt[3]{a}$ D. $6\sqrt[3]{64a}$

Simplify the root, if possible.

24. $\sqrt{16x^2 + 40x + 25}$

A. $(4x+5)^2$ B. $|4x+5|$
C. cannot be simplified D. $4x+5$

Find the slope of the line passing through the given pair of points.

25. (–4, 1) and (–9, 1)

A. $-\frac{2}{13}$ B. Not defined C. $-\frac{2}{5}$ D. 0

Find an equation in slope–intercept form for the line.

26. Through (–10, –4.5) and (–6, 0.5)

A. $y = -0.8x - 12.5$ B. $y = -1.25x - 17$ C. $y = 0.8x + 3.5$ D. $y = 1.25x + 8$

Rationalize the denominator. Assume that all radicands represent positive real numbers.

27. $\dfrac{7-\sqrt{10}}{7+\sqrt{10}}$

A. $\dfrac{59-14\sqrt{10}}{39}$ B. $\dfrac{39-14\sqrt{10}}{59}$ C. $\dfrac{59+14\sqrt{10}}{39}$ D. 1

Find the values of the variables in the equation.

28. $\begin{bmatrix} t+7 & 5 & 4 \\ 7 & -7 & 2 \end{bmatrix} = \begin{bmatrix} -3 & 5 & 4 \\ 7 & x-8 & 2 \end{bmatrix}$

A. $t=-10, x=-15$ B. $t=14, x=-15$ C. $t=-10, x=1$ D. $t=-3, x=-7$

Find the value.

29. Let $C = \begin{bmatrix} 1 \\ -3 \\ 2 \end{bmatrix}$ and $D = \begin{bmatrix} -1 \\ 3 \\ -2 \end{bmatrix}$; $C-2D$

A. $\begin{bmatrix} -1 \\ 3 \\ -2 \end{bmatrix}$ B. $\begin{bmatrix} -3 \\ 9 \\ -6 \end{bmatrix}$ C. $\begin{bmatrix} 3 \\ -6 \\ 4 \end{bmatrix}$ D. $\begin{bmatrix} 3 \\ -9 \\ 6 \end{bmatrix}$

The sizes of two matrices A and B are given. Find the sizes of the product AB and the product BA, whenever these products exist.

30. A is 4×3, and B is 4×3.

A. 4×3; 3×4
B. 4×4; 3×3
C. AB does not exist; BA does not exist.
D. 3×4; 4×3

Find the matrix product, if possible.

31. $\begin{bmatrix} 0 & -2 \\ 2 & 3 \end{bmatrix}\begin{bmatrix} -1 & 3 & 2 \\ 0 & -1 & 1 \end{bmatrix}$

A. $\begin{bmatrix} 0 & 2 & -2 \\ -2 & 3 & 7 \end{bmatrix}$ B. $\begin{bmatrix} 0 & -2 & 2 \\ 3 & -2 & 7 \end{bmatrix}$ C. $\begin{bmatrix} 0 & -6 & -4 \\ 0 & -3 & 3 \end{bmatrix}$ D. Does not exist

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Find the inverse, if it exists, for the matrix.

32. $\begin{bmatrix} 2 & 6 \\ -1 & -2 \end{bmatrix}$

A. $\begin{bmatrix} -1 & 3 \\ -\frac{1}{2} & 1 \end{bmatrix}$

B. $\begin{bmatrix} \frac{1}{2} & 1 \\ -1 & -3 \end{bmatrix}$

C. $\begin{bmatrix} 1 & -3 \\ \frac{1}{2} & -1 \end{bmatrix}$

D. $\begin{bmatrix} -1 & -3 \\ \frac{1}{2} & 1 \end{bmatrix}$

Find the probability.

33. A bag contains 6 red marbles, 3 blue marbles, and 1 green marble. What is the probability that a randomly selected marble is not blue?

A. $\frac{10}{7}$ B. 7 C. $\frac{3}{10}$ D. $\frac{7}{10}$

How many distinguishable permutations of letters are possible in the word?

34. GIGGLE

A. 4320 B. 36 C. 120 D. 720

Solve the problem.

35. A shirt company has 3 designs that can be made with short or long sleeves. There are 6 color patterns available. How many different types of shirts are available from this company?

A. 36 types B. 11 types C. 9 types D. 18 types

36. A restaurant offered salads with 3 types of dressings and one choice of 5 different toppings. How many different types of salads could be offered?

A. 25 types B. 8 types C. 9 types D. 15 types

37. A bag contains 5 apples and 3 oranges. If you select 4 pieces of fruit without looking, how many ways can you get exactly 3 apples?

A. 180 ways B. 20 ways C. 30 ways D. 60 ways

Answer Key
Testname: 2019.COMPUTATIONAL MATH

1. C
2. C
3. C
4. D
5. A
6. B
7. A
8. C
9. D
10. C
11. C
12. B
13. B
14. B
15. B
16. D
17. B
18. B
19. C
20. C
21. D
22. B
23. A
24. B
25. D
26. D
27. A
28. C
29. D
30. C
31. A
32. D
33. D
34. C
35. A
36. D
37. C