

Pre-Calculus 11 - VLN

Chapter 4: Rationals

Lesson 1: Introduction to Rational Expressions

Question #1

Reference Q.13783

Determine the restriction on the given variable.

- a. $\frac{6}{8x - 7}$
- b. $\frac{y}{10y + 20}$
- c. $\frac{5a}{5 - a}$
- d. $\frac{a^2 + 7a + 12}{(a + 4)(a + 5)}$
- e. $\frac{12y^2 - 2}{y}$
- f. $\frac{1 + 16x^2}{1 - 16x^2}$
- g. $\frac{40p^3 - 4}{8q^3}$
- h. $\frac{3}{x^2 + 13x + 12}$
- i. $\frac{d}{d^2 - 8d + 16}$

Question #2

Reference Q.13784

Express in simplest form, stating the nonpermissible values of the variable.

- a. $\frac{4ab}{16a}$
- b. $\frac{25x^3y^4}{5y^9}$
- c. $\frac{(a + 3)(a - 8)}{(a + 1)(a - 8)}$
- d. $\frac{(x + 7)(x - 2)}{x(x - 2)(x + 14)}$

Question #3

Reference Q.13787

Express in simplest form, and state the restriction.

- a. $\frac{y + 9}{y^2 - 81}$
- b. $\frac{25y^2 - 36}{5y + 6}$
- c. $\frac{64 - 9p^2}{(8 - 3p)(3 + 8p)}$
- d. $\frac{x^2 - 100}{(x + 10)^2}$

Question #4

Reference Q.15161

The area of a soccer field is represented by $a^2 - 12a + 32$ square metres.

- a. Find a simplified expression for the length of the field if the width can be represented by $a - 8$ metres.
- b. Calculate the area of the field if $a = 90$.

Question #5

Reference Q.15163

$\frac{(x - y)^2}{x^2 - y^2}$ is equivalent to

- A. 0
- B. 1
- C. $\left(\frac{1}{x} - \frac{1}{y}\right)^2$
- D. $\frac{x - y}{x + y}$

Question #6

Reference Q.15165

The rational expressions $\frac{x^2 + 13x + 40}{x^2 - 13x + 40}$ and $\frac{64 + x^2}{64 - x^2}$ have one nonpermissible value in common. The nonpermissible value is ____.

Question #7

Reference Q.15166

Reduce to lowest terms, stating the restrictions on the variable.

a. $\frac{5a^3 - 15a^2}{30a}$

b. $\frac{7x}{7x - 21}$

c. $\frac{6a - 3}{8a - 4}$

d. $-\frac{4a - 12}{a - 3}$

e. $-\frac{a^2}{a^2 + a}$

f. $\frac{3t^2 - 75}{(t + 3)(t - 5)}$

g. $\frac{2 - r}{r - 2}$

h. $-\frac{9a^2 - 1}{1 - 3a}$

i. $\frac{2b^2 - 18b}{b(b - 9)^2}$

Question #8

Reference Q.15167

Express in simplest form, stating the values of the variable for which the expression is not defined.

a. $\frac{t^2 + 4t + 4}{2t^2 + 10t + 12}$

b. $\frac{2x^2 + 5x - 3}{4x - 2}$

c. $\frac{2y^2 - 3y - 2}{2y^2 - y - 6}$

Question #9

Reference Q.15168

Express in simplest form, stating the values of the variable for which the expression is not defined.

a. $\frac{3t^2 - 5t - 12}{2t^2 - 6t}$

b. $\frac{32 - 2a^2}{2a^2 + 4a - 16}$

c. $\frac{4 - 4x^2}{8x^3 + 8x^2 - 16x}$

Question #10

Reference Q.15169

Express in simplest form, stating the restrictions on the variable

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

b. $\frac{16x^4 - y^4}{8x^3 + 4x^2y + 2xy^2 + y^3}$

Question #11

Reference Q.15170

A rectangular prism has a length of p cm and a width and height that are each 2cm less than the length.

- Write an expression in terms of p for the surface area of the prism, and express the surface area in simplest factored form.
- The rectangular prism has two square faces. Write an expression in simplest factored form which represents the total length of the edges which make up these two squares.
- If the ratio of the surface area in a) to the edge length in b) is 10:1, find the volume of the prism.

Question #12

Reference Q.15171

Simplify, where possible, and state the nonpermissible values for x in terms of y .

a. $\frac{x + y}{4x + 4y}$

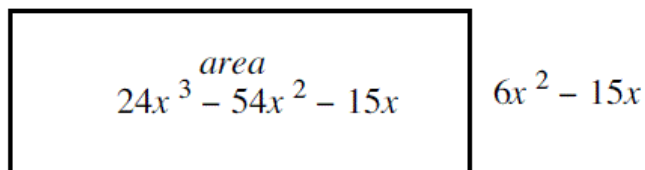
b. $\frac{4x^2 - y^2}{y - 2x}$

c. $\frac{3x + 12y}{x^2 - 16y^2}$

Question #13

Reference Q.15203

Consider the rectangle shown.



- Write and simplify an expression for the length of the rectangle.
- Determine the perimeter of the rectangle if $x = 2\sqrt{2}$ cm. Give the answer in simplest radical form.

Question #14

Reference Q.15205

Write a rational expression in x with a numerator of 1 and a denominator written as an integral polynomial so that the nonpermissible values are

- $x \neq 2, 3$
- $x \neq -2, 0$
- $x \neq -\frac{3}{4}, \frac{1}{3}$
- $x \neq \pm 2, 0$

Question #15

Reference Q.15209

With appropriate restrictions, the simplified form of

$$\frac{x^2 - 121}{3x^2 + 29x - 44} \text{ is}$$

- $\frac{x - 11}{3x - 4}$
- $\frac{x - 11}{x - 11}$
- $\frac{3x + 4}{x + 11}$
- $\frac{3x - 4}{x + 11}$

Question #16

Reference Q.15207

If the rational expression $\frac{8a^2 + 22a + k}{2a^2 - 11a - 21}$, where k is a constant,

reduces to $\frac{4a + 5}{a - 7}$, then the value of k , to the nearest whole number, is ____.