

Find the domain of the rational expression.

1) $f(x) = \frac{x^2 - 25}{x^2 - 5x + 6}$

1) _____

Provide an appropriate response.

2) For a certain computer desk, the manufacturing cost C per desk (in dollars) is

2) _____

$$C = \frac{500x + 7000}{x}$$

where x is the number of desks manufactured.

a. Find the average cost per desk when manufacturing 200 desks.

b. Find the average cost per desk when manufacturing 1000 desks.

Solve the problem.

3) If $f(x) = \frac{x - 10}{5x + 8}$, find $f(-2)$.

3) _____

4) To calculate the drug dosage for a child, a pharmacist may use the formula

4) _____

$$d(x) = \frac{Dx}{x + 8}, \quad 0 \leq x \leq 12.$$

The child's age is x and the adult dosage is D . What is the dosage for an 5-year old child if the adult dosage is 10 mg? (Round to the nearest tenth.)

Simplify the rational expression.

5) $\frac{5x - 15}{3x - 9}$

5) _____

6) $\frac{4m^3 - 4m^2 - 120m}{m^2 - 11m + 30}$

6) _____

7) $\frac{b - a}{a^2 - b^2}$

7) _____

Find the quotient and simplify.

8) $\frac{p^2 - 9p + pq - 9q}{6p^2 - 6q^2} \div \frac{p - 9}{4p - 4q}$

8) _____

9) $\frac{x + 9}{-2 - x} \div \frac{x^2 - 2x - 63}{x^2 - 7x - 18}$

9) _____

Find the product and simplify.

10) $\frac{3x^2}{4} \cdot \frac{8}{x^3}$

10) _____

Perform the indicated operation and simplify if possible.

$$11) \frac{6}{x+2} \cdot (8x+16)$$

11) _____

Perform the indicated operation. Simplify if possible.

$$12) \frac{4x}{x-5} - \frac{20}{x-5}$$

12) _____

Perform the indicated operation and simplify if possible.

$$13) \frac{y^2 - 6y + 8}{2y + 4} \cdot \frac{y + 2}{4y - 16}$$

13) _____

$$14) \frac{2x}{x-3} - \frac{x+5}{x-3}$$

14) _____

$$15) \frac{7a}{a^2 + 7a + 12} - \frac{2}{a+4}$$

15) _____

Solve the equation.

$$16) \frac{m+2}{m^2+8m+15} - \frac{2}{m^2+10m+25} = \frac{m-2}{m^2+8m+15}$$

16) _____

Perform the indicated operation and simplify if possible.

$$17) \frac{14}{x^2-1} + \frac{7}{x+1}$$

17) _____

Find the product and simplify.

$$18) \frac{x^2+10x+21}{x^2+15x+56} \cdot \frac{x^2+16x+64}{x^2+11x+24}$$

18) _____

Perform the indicated operation and simplify if possible.

$$19) \frac{x^2-16}{x^2+4x} \div \frac{x^2+3x+1}{2x+6}$$

19) _____

$$20) \frac{x+2}{x^2-7x+6} + \frac{4x-1}{x^2-9x+18}$$

20) _____

Solve the equation.

$$21) \frac{1}{y} + 2 = \frac{11}{2}$$

21) _____

Perform the indicated operation. Simplify if possible.

$$22) \frac{5x-11}{x^2-2x-35} - \frac{4x-4}{x^2-2x-35}$$

22) _____

Solve the equation.

$$23) \frac{3}{y-5} = \frac{4}{y+5}$$

23) _____

$$24) \frac{6}{a-6} = \frac{a}{a-6} + 6$$

24) _____

Perform the indicated operation. Simplify if possible.

$$25) \frac{x}{x^2-9} - \frac{3}{9-x^2}$$

25) _____

$$26) \frac{x-2}{x^2+9x+20} + \frac{3x+7}{x^2+5x+4}$$

26) _____

$$27) \frac{x}{x^2-16} - \frac{3}{x^2+5x+4}$$

27) _____

Perform the indicated operations. Simplify if possible.

$$28) \frac{3x}{x+1} + \frac{4}{x-1} - \frac{6}{x^2-1}$$

28) _____

Solve the equation.

$$29) x - \frac{11}{x-1} = 3 - \frac{2x}{x-1}$$

29) _____

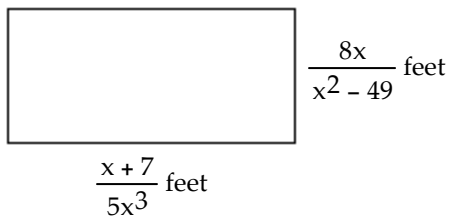
$$30) \frac{4}{x^2-9} = \frac{8}{x+3} - \frac{4}{x-3}$$

30) _____

Solve.

31) Find the area of the rectangle.

31) _____



Simplify the complex fraction.

$$32) \frac{\frac{x^6}{9y^5}}{\frac{x^4}{y^3}}$$

32) _____

33)

$$\frac{\frac{3}{y} + \frac{5}{y^2}}{\frac{9}{y^2} - \frac{25}{y}}$$

33) _____

Solve.

34) In a sample of 75 fluorescent bulbs, 3 were found to be defective. At this rate, how many defective bulbs should be found in 525 bulbs?

34) _____

35) One number plus fourteen times its reciprocal is equal to nine.

35) _____

36) A cyclist bikes at a constant speed for 16 miles. He then returns home at the same speed but takes a different route. His return trip takes one hour longer and is 21 miles. Find his speed.

36) _____

37) A boat moves 7 kilometers upstream in the same amount of time it moves 17 kilometers downstream. If the rate of the current is 9 kilometers per hour, find the rate of the boat in still water.

37) _____

38) A painter can finish painting a house in 8 hours. Her assistant takes 10 hours to finish the same job. How long would it take for them to complete the job if they were working together?

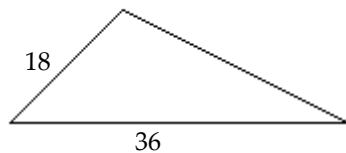
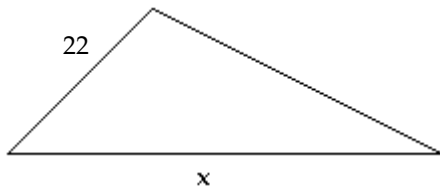
38) _____

39) One pump can drain a pool in 11 minutes. When a second pump is also used, the pool only takes 4 minutes to drain. How long would it take the second pump to drain the pool if it were the only pump in use?

39) _____

Given that the pair of triangles are similar, find x.

40)

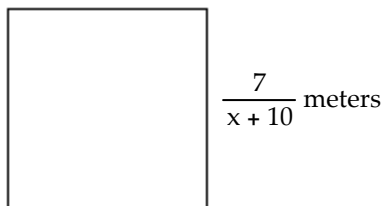


40) _____

Solve.

41) A square shaped pasture has a side of length $\frac{7}{x+10}$ meters.

41) _____



Express the perimeter of the pasture as a rational expression.

Solve the equation for the indicated variable.

42) $\frac{1}{a} + \frac{1}{b} = c$ for a

42) _____

Solve the proportion.

43) $\frac{11}{12} = \frac{x-10}{x-4}$

43) _____

Answer Key

Testname: MATH115T7SP09

1) $\{x \mid x \text{ is a real number and } x \neq 3, x \neq 2\}$

2) a. \$535

b. \$507

3) 6

4) 3.8 mg

5) $\frac{5}{3}$

6) $\frac{4m(m+5)}{(m-5)}$

7) $-\frac{1}{a+b}$

8) $\frac{2}{3}$

9) $-\frac{x+9}{x+7}$

10) $\frac{6}{x}$

11) 48

12) 4

13) $\frac{y-2}{8}$

14) $\frac{x-5}{x-3}$

15) $\frac{5a-6}{(a+3)(a+4)}$

16) -7

17) $\frac{7}{x-1}$

18) 1

19) $\frac{2(x-4)(x+3)}{x(x^2+3x+1)}$

20) $\frac{5x^2-6x-5}{(x-6)(x-1)(x-3)}$

21) $\frac{2}{7}$

22) $\frac{1}{x+5}$

23) 35

24) no solution

25) $\frac{1}{x-3}$

26) $\frac{4x^2+21x+33}{(x+4)(x+5)(x+1)}$

27) $\frac{x^2-2x+12}{(x-4)(x+4)(x+1)}$

Answer Key

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28) $\frac{3x - 2}{x - 1}$

29) -2, 4

30) 10

31) $\frac{8}{5x^2(x - 7)}$ sq ft

32) $\frac{x^2}{9y^2}$

33) $\frac{3y + 5}{9 - 25y}$

34) 21

35) 2 or 7

36) 5 mph

37) $21\frac{3}{5}$ km/hr

38) $4\frac{4}{9}$ hr

39) $6\frac{2}{7}$ min

40) $x = 44$

41) $\frac{28}{x + 10}$ m

42) $a = \frac{b}{bc - 1}$

43) 76