A.4.2 Homework

Write your work on a separate sheet of paper!

Find the domain of the expression

1. $\frac{x+9}{x^2-x-12}$
2. $\frac{x-3}{5x-3}$
3. $\frac{x^2+5x-36}{x^2+7x+6}$
4. $\frac{64x^2-25}{-8x^2-10x}$
5. $\frac{x^2+5x-36}{x^2-8x+12}$
6. $\frac{16x^2-9}{-9x^2-10x}$

Simplify. Find the domain before cancelling out factors.

7. $\frac{9f+fg}{4f}$
8. $\frac{5p+pq}{8p}$
9. $\frac{4f+fg}{7f}$
10. $\frac{12x-24}{8-4x}$
11. $\frac{6x-24}{12-3x}$
12. $\frac{x^2+2x-35}{5-x}$
13. $\frac{x^2-5x-14}{7-x}$
14. $\frac{x^2-5x-14}{x^2-49}$
15. $\frac{u-1}{u^2-1}$
16. $\frac{x^2-x-12}{x^2-16}$
17. $\frac{j+8}{j^2-64}$
18. $\frac{x^2+5x-14}{2-x}$
19. $\frac{x^2+7x-18}{x^2-4}$
20. $\frac{x^2-9}{27-x^3}$

A.4.2 homework

finding domain:
Look for x-values that will yield an undefined expression

dividing by zero or taking the square root of a negative number

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

Look at factors in the denominator

$x-4 \neq 0$ $\quad x+3 \neq 0$

$x \neq 4$ $\quad x \neq -3$

domain: all real numbers x such that $x \neq -3, 4$.

2. $\frac{x-3}{5x-3}$

$5x-3 \neq 0$

$x \neq \frac{3}{5}$

domain: all real numbers x such that $x \neq 3/5$

3. $\frac{x^2+5x-36}{x^2+7x+6} = \frac{x^2+5x-36}{(x+6)(x+1)}$

$x+6 \neq 0$ $\quad x+1 \neq 0$

$x \neq -6$ $\quad x = -1$

domain: all real numbers x such that $x \neq -6, -1$

4-6 (just answers)

4. Domain: all real #'s x such that $x \neq 0, \frac{-5}{4}$

5. Domain: all real #'s x such that $x \neq 6, 2$

6. Domain: all real #'s x such that $x \neq \frac{-10}{9}, 0$

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7. $\frac{9f+fg}{4f} = \frac{f(9+g)}{f(4)} \rightarrow \frac{9+g}{4}, f \neq 0$

($f \neq 0$)

8. $\frac{5p+pq}{8p} = \frac{p(5+q)}{p(8)} = \frac{5+q}{8}, p \neq 0$

($p \neq 0$)

9. $\frac{4f+fg}{7f} = \frac{f(4+g)}{f(7)} = \frac{4+g}{7}, f \neq 0$

($f \neq 0$)

10. $\frac{12x-24}{8-4x} = \frac{12(x-2)}{4(2-x)} = \frac{12(x-2)}{-4(x-2)} = \frac{12}{-4} = -3, x \neq 2$

($x \neq 2$)

11. $\frac{6x-24}{12-3x} = \frac{6(x-4)}{-3(x-4)} = \frac{6}{-3} = -2, x = -4$

($x \neq 4$)

12. $\frac{x^2+2x-35}{5-x} = \frac{(x+7)(x-5)}{-1(x-5)} = -(x+7), x \neq 5$

($x \neq 5$)

13. $\frac{x^2-5x-14}{7-x} = \frac{(x-7)(x+2)}{-1(x-7)} = -(x+2),\ x \neq 7$

$x \neq 7$

14. $\frac{x^2-5x-14}{x^2-49} = \frac{(x-7)(x+2)}{(x-7)(x+7)} = \frac{x+2}{x+7},\ x \neq \pm 7$

$x \neq 7 \quad x \neq -7$

15. $\frac{u-1}{u^2-1} = \frac{u-1}{(u+1)(u-1)} = \frac{1}{u+1},\ u \neq -1, 1$

$u \neq -1 \quad u \neq 1$

16. $\frac{x^2-x-12}{x^2-16} = \frac{(x-4)(x+3)}{(x-4)(x+4)} = \frac{x+3}{x+4},\ x \neq \pm 4$

$x \neq 4 \quad x \neq -4$

17. $\frac{j+8}{j^2-64} = \frac{j+8}{(j+8)(j-8)} = \frac{1}{j-8},\ j \neq \pm 8$

$j \neq -8 \quad j \neq 8$

18. $\frac{x^2+5x-14}{2-x} = \frac{(x+7)(x-2)}{-1(x-2)} = -(x+7),\ x \neq 2$

$x \neq 2$

19. $\frac{x^2+7x-18}{x^2-4} = \frac{(x+9)(x-2)}{(x+2)(x-2)} = \frac{x+9}{x+2},\ x \neq \pm 2$

$x \neq -2 \quad x \neq 2$

20. $\frac{x^2-9}{27-x^3} = \frac{(x+3)(x-3)}{(3-x)(9+3x+x^2)} = \frac{(x+3)(x-3)}{-1(x-3)(9+3x+x^2)}$

$x \neq 3$

$= \frac{x+3}{9+3x+x^2},\ x \neq 3$