

Math III

Simplifying Rational Expression and Finding Domain

Find the domain.

1. $\frac{12}{x}$

2. $\frac{x+1}{x}$

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

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

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

6. $\frac{9x}{7x+1}$

7. $\frac{2x}{x^2-5x+6}$

8. $\frac{x-1}{x^2+4x+3}$

9. $\frac{6x+17}{2x^2+x-3}$

10. $\frac{3x+7}{2x^2-7x-4}$

Simplify.

11. $\frac{xy^3}{x^2y}$

12. $\frac{x^2y}{xy}$

13. $\frac{5ab^3}{10ab^4}$

14. $\frac{12a^2b}{4a^3b}$

15. $\frac{15xy^3z}{25x^2y^2z}$

16. $\frac{8ab^2c^3}{36a^2bc^2}$

17. $\frac{18(x-4)}{48(x-4)}$

18. $\frac{48(x+3)}{60(x+3)}$

19. $\frac{(x-2)(x+1)}{(x-2)(x-1)}$

20. $\frac{(x+5)(x-3)}{(x-4)(x-3)}$

21. $\frac{x-2}{x^2-4}$

22. $\frac{a+3}{a^2-9}$

23. $\frac{x-4}{16-x^2}$

24. $\frac{x^3-8}{2-x}$

25. $\frac{20-30x}{3x^2-2x}$

26. $\frac{15-3x}{2x^2-10x}$

27. $\frac{x^2-1}{2x^2+x-3}$

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

29. $\frac{x^2-7x+6}{x^2+3x-54}$

30. $\frac{2x^2+x-1}{x^2-x-2}$

31. $\frac{x^2+7x-8}{x^2+6x-7}$

32. $\frac{x^2+4x+4}{x^2+7x+10}$

33. $\frac{6-x}{x^2+3x-54}$

34. $\frac{5-x}{x^2-x-20}$

35. $\frac{x^3-3x^2}{2x^2-6x}$

36. $\frac{x^4-y^4}{x^3+xy^2}$

37. $\frac{2x^3-5x^2+4x}{4x^3-4x^2-8x}$

38. $\frac{3x^3-3x^2-18x}{6x^3-56x^2+54x}$

Do Probs 31 - 38 below (skip 36)

Name: _____

1 $\frac{12}{x}$

$x \neq 0$

2 $\frac{x+1}{x}$

$x \neq 0$

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

$x \neq 2$

4 $\frac{3x}{x-5}$

$x \neq 5$

5 $\frac{x-4}{3x+4}$

$3x+4=0$
 $3x = -4$
 $x = -\frac{4}{3}$

$x \neq -\frac{4}{3}$

6 $\frac{9x}{7x+1}$

$x \neq -\frac{1}{7}$

7 $\frac{2x}{x^2-5x+6}$

$(x-3)(x-2)$

$x \neq 3$ $x \neq 2$

~~$\frac{3}{-2}$~~
 ~~$\frac{-5}{-5}$~~

8 $\frac{x-1}{x^2+4x+3}$

$(x+3)(x+1)$

$x \neq -3$ $x \neq -1$

~~$\frac{3}{4}$~~
 ~~$\frac{1}{1}$~~

9 $\frac{6x+17}{2x^2+x-3}$

$(2x+3)(x-1)$

$x \neq -\frac{3}{2}$ $x \neq 1$

~~$\frac{-6}{1}$~~
 ~~$\frac{-2}{-2}$~~

x^2+x-6


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<p>10 $\frac{3x+7}{2x^2-7x-4}$ $\frac{-8}{-7} \frac{1}{1}$</p> <p>$(x-\frac{8}{2})(x+1)$ $(x-4)(2x+1)$</p> <p>$x \neq 4 \quad x \neq -\frac{1}{2}$</p>	<p>11 $\frac{xy^3}{x^2y}$ $\frac{\cancel{x}y\cancel{y}y}{\cancel{x}x\cancel{y}}$</p> <p>$\frac{y^2}{x}$</p>	<p>12 $\frac{x^2y}{xy}$ $\frac{\cancel{x}xy}{\cancel{x}y}$</p> <p>$x$</p>
<p>13 $\frac{5ab^3}{10ab^4}$ $\frac{5\cancel{a}\cancel{b}\cancel{b}\cancel{b}}{2\cdot 5\cancel{a}\cancel{b}\cancel{b}\cancel{b}}$</p> <p>$\frac{1}{2b}$</p>	<p>14 $\frac{12a^2b}{4a^3b}$ $\frac{3\cdot 4\cancel{a}\cancel{a}b}{4\cancel{a}\cancel{a}ab}$</p> <p>$\frac{3}{a}$</p>	<p>15 $\frac{15xy^3z}{25x^2y^2z}$ $\frac{5\cdot 3\cancel{x}y\cancel{y}y\cancel{z}}{5\cdot 5\cancel{x}x\cancel{y}y\cancel{z}}$</p> <p>$\frac{3y}{5x}$</p>

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<p>16 $\frac{8ab^2c^3}{36a^2bc^2}$ $\frac{8ab^2c^3}{8 \cdot 4 \cdot a \cdot b \cdot c \cdot c}$</p> <p>$\frac{bc}{4a}$</p>	<p>17 $\frac{18(x-4)}{48(x-4)}$</p> <p>$\frac{3}{8}$</p>	<p>18 $\frac{48(x+3)}{60(x+3)}$</p> <p>$\frac{4}{5}$</p>
<p>19 $\frac{(x-2)(x+1)}{(x-2)(x-1)}$</p> <p>$\frac{x+1}{x-1}$</p>	<p>20 $\frac{(x+5)(x-3)}{(x-4)(x-3)}$</p> <p>$\frac{x+5}{x-4}$</p>	<p>21 $\frac{x-2}{x^2-4} \rightarrow \frac{x-2}{(x+2)(x-2)}$</p> <p>$\frac{1}{x+2}$</p>
<p>22 $\frac{a+3}{a^2-9} \rightarrow \frac{a+3}{(a+3)(a-3)}$</p> <p>$\frac{1}{a-3}$</p>	<p>23 $\frac{x-4}{16-x^2}$ $\frac{x-4}{-x^2+16}$</p> <p>$\frac{x-4}{-1(x^2-16)}$ $\frac{x-4}{-(x+4)(x-4)}$</p> <p>$\frac{1}{-(x+4)}$</p>	<p>24 $\frac{x^3-8}{2-x}$ $\frac{x-2}{-(x-2)}$</p> <p>$\frac{(x-2)(x^2+2x+4)}{-(x-2)}$</p> <p>$\frac{x^2+2x+4}{-1}$</p>

<p>25</p> $\frac{20 - 30x}{3x^2 - 2x}$ $\frac{-10(3x-2)}{x(3x-2)}$ $\frac{-10}{x}$	<p>26</p> $\frac{15 - 3x}{2x^2 - 10x}$ $\frac{-3(x-5)}{2x(x-5)}$ $\frac{-3}{2x}$	<p>27</p> $\frac{x^2 - 1}{2x^2 + x - 3}$ $\frac{(x+1)(x-1)}{(2x+3)(x-1)}$ $\frac{x+1}{2x+3}$
<p>28</p> $\frac{x^2 - 4x + 4}{x^2 - 4}$ $\frac{(x-2)(x-2)}{(x+2)(x-2)}$ $\frac{x-2}{x+2}$	<p>29</p> $\frac{x^2 - 7x + 6}{x^2 + 3x - 54}$ $\frac{(x-1)(x-6)}{(x-6)(x+9)}$ $\frac{x-1}{x+9}$	<p>30</p> $\frac{2x^2 + x - 1}{x^2 - x - 2}$ $\frac{(x+1)(2x-1)}{(x-2)(x+1)}$ $\frac{2x-1}{x-2}$
<p>$x^2 - 2^2$ $(x+2)(x-2)$</p>	<p>$\frac{6}{-7} \times \frac{-1}{-1}$ $\frac{-54}{3} \times \frac{-6}{-6}$</p>	<p>Created with Doceri </p>

Do Probs 31 - 38 below (skip 36)

<p>31</p> $\frac{x^2 + 7x - 8}{x^2 + 6x - 7}$ $\frac{(x+8)\cancel{(x-1)}}{(x+7)\cancel{(x-1)}}$ $\frac{x+8}{x+7}$	<p>32</p> $\frac{x^2 + 4x + 4}{x^2 + 7x + 10}$ $\frac{(x+2)\cancel{(x+2)}}{(x+5)\cancel{(x+2)}}$ $\frac{x+2}{x+5}$	<p>33</p> $\frac{6-x}{x^2 + 3x - 54}$ $\frac{-\cancel{(x-6)}}{\cancel{(x-6)}(x+9)}$ $\frac{-1}{x+9}$	<p>34</p> $\frac{5-x}{x^2 - x - 20}$ $\frac{-\cancel{(x-5)}}{\cancel{(x-5)}(x+4)}$ $\frac{-1}{x+4}$
<p>35</p> $\frac{x^3 - 3x^2}{2x^2 - 6x}$ $\frac{x^2\cancel{(x-3)}}{2x\cancel{(x-3)}}$ $\frac{x}{2}$	<p>36</p> <p style="text-align: center;">-</p>	<p>37</p> $\frac{6-x}{-1 \cdot \frac{-x+6}{-1}}$ $-1(x-6)$	<p>38</p>

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37

$$\frac{2x^3 - 6x^2 + 4x}{4x^3 - 4x^2 - 8x}$$

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

$$\frac{\cancel{(x-2)}(x-1)}{2\cancel{(x-2)}(x+1)}$$

$$\frac{x-1}{2(x+1)}$$

38

$$\frac{3x^3 - 3x^2 - 18x}{6x^3 - 36x^2 + 54x}$$

$$\frac{1) \cancel{3}x(x^2 - x - 6)}{2) \cancel{6}x(x^2 - 6x + 9)}$$

$$\frac{\cancel{(x-3)}(x+2)}{2(x-3)\cancel{(x-3)}}$$

$$\frac{x+2}{2(x-3)}$$

$$\begin{array}{r} -3 \cancel{-6} / 2 \\ -1 \end{array} \quad \begin{array}{r} 9 \cancel{-3} \\ -6 \end{array}$$

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