

MATH 110
FINAL REVIEW A

Find the domain of the expression

1. $\frac{y-17}{y^2-9y-22}$

- a) $(-\infty, -2) \cup (-2, 11) \cup (11, 17) \cup (17, \infty)$ b) $(-\infty, 17) \cup (17, \infty)$ c) $(-\infty, \infty)$ d) $(-\infty, -2) \cup (-2, 11) \cup (11, \infty)$

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

- a) $\{x|x \neq 4\}$ b) $\{x|x = 4\}$ c) $\{x|x \neq -4\}$ d) $\{x|x \neq 4, x \neq -5\}$

3. $\frac{3y^2-12}{y^2+4}$

- a) $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$ b) $(-\infty, \infty)$ c) $(-\infty, -2) \cup (-2, \infty)$ d) $(-\infty, 2) \cup (2, \infty)$

4. $g(y) = \sqrt[4]{6y-24}$

- a) $[4, \infty)$ b) $(4, \infty)$ c) $(-\infty, \infty)$ d) $(-\infty, 4]$

Reduce the expression

5. $\frac{-15(9x-3)(x+10)}{3(x+10)^2}$

- a) $\frac{-5(9x-3)}{(x+10)}$ b) $\frac{-15(9x-3)}{3}$ c) $-5(9x-3)$ d) $\frac{5(9x-3)}{(x+10)}$

Find all solutions to the equation

6. $3t^2 + 11t - 20 = 0$

- a) $t = -\frac{5}{3}, t = 4$ b) $t = \frac{4}{3}, t = -5$ c) $t = -\frac{4}{3}, t = 5$ d) $t = \frac{5}{3}, t = -4$

7. $-17w + 40 = 8w^2 + 5w$

- a) $w = 8, w = -\frac{5}{8}$ b) $w = 20, w = \frac{29}{4}$ c) $w = -3, w = \frac{6}{5}$ d) $w = \frac{5}{4}, w = -4$

Solve the equation by using the square root property

8. $r^2 = 81$

- a) $r = 9$ b) $r = \pm 9$ c) No Solution d) None of the Above

Solve using the quadratic formula

9. $11y - 6 + 30y^2 = 0$

- a) $y = 0.3 + 3.7i, y = 0.3 - 3.7i$ b) $y = \frac{1}{3}, y = \frac{2}{5}$ c) $y = -\frac{2}{3}, y = \frac{3}{10}$ d) $y = \frac{3}{2}, y = -\frac{10}{3}$

10. $7x(x-2) = 5$

- a) $x = \frac{14 \pm 2i\sqrt{21}}{7}$ b) $x = \frac{7 \pm \sqrt{21}}{2}$ c) $x = 1 \pm 4\sqrt{21}$ d) $x = \frac{7 \pm 2\sqrt{21}}{7}$

11. Find the discriminant, $b^2 - 4ac$, and determine the number and type of solutions. Choose from two rational solutions, one rational solution, two irrational solutions, or two imaginary solutions.

$$6n^2 = 8$$

- a) -192: Two imaginary solutions b) 192: Two imaginary solutions
c) 192: Two irrational solutions d) None of the above

Solve the equation

12. $\frac{z^2}{8} - \frac{1}{4} = \frac{17z}{24}$

- a) No solution b) $z = 3, z = -\frac{2}{3}$ c) $z = 6$ d) $z = -\frac{1}{3}, z = 6$

13. $\frac{3}{x} + \frac{3}{x-6} = \frac{3x-15}{x-6}$

- a) $x = 1$ b) $x = 6, x = 1$ c) $x = -\frac{5}{2}, x = \frac{1}{3}$ d) No solution

14. Multiply: $\frac{12}{2x-y} \cdot \frac{3y-6x}{4}$

- a) $\frac{y-2x}{2x-y}$ b) $\frac{16}{-4x^2 + 4xy - y^2}$ c) $\frac{-3(3y-6x)}{2x-y}$ d) -9

15. Divide: $\frac{x-3}{x+3} \div \frac{x^2-3x}{5x}$

- a) $\frac{5}{3x}$ b) $\frac{x^3 - 6x^2 + 9x}{5x^2 + 15x}$ c) $\frac{5}{x+3}$ d) $\frac{x+3}{5x^2 - 3x}$

16. Multiply: $\frac{7x-28}{x} \cdot \frac{x^2+3x}{4x-16}$

- a) $\frac{7x^3 - 84x}{4x^2 - 16x}$ b) $\frac{7(x+3)}{4}$ c) $\frac{7x^2 + 21x}{4x^2 - 16}$ d) $\frac{4(x-4)}{x}$

17. Divide: $\frac{\frac{18}{z^4}}{\frac{12}{z}}$

- a) $\frac{3}{2z^3}$ b) $\frac{216}{z^5}$ c) $\frac{18+z}{z^4+z}$ d) $\frac{3z^3}{2}$

18. Subtract: $\frac{7n+14}{n^2-5} - \frac{-3+2n}{n^2-5}$

- a) $5n+17$ b) $\frac{5n+17}{n^2-5}$ c) $\frac{9n+17}{n^2-5}$ d) $\frac{9n+11}{n^2-5}$

Perform the indicated operations

19. $\frac{4y}{y^2 - 3y - 10} + \frac{y+1}{y-5} - \frac{2y-7}{y+2}$

a) $\frac{-y^2 + 24y - 33}{y^2 - 3y - 10}$ b) $\frac{-y^2 - 10y + 37}{y^2 - 3y - 10}$ c) $\frac{3y+8}{y^2 - 4y - 13}$ d) $\frac{3y+8}{(y^2 - 3y - 10)(y-5)(y+2)}$

20. $\frac{8}{x+5} - \frac{3}{x-5} + \frac{5}{x^2 - 25}$

a) $\frac{8x+3}{x^2 - 25}$ b) $\frac{25x+25}{x-5}$ c) $\frac{5x-50}{x^2 - 25}$ d) $\frac{3x-5}{x^2 - 5}$

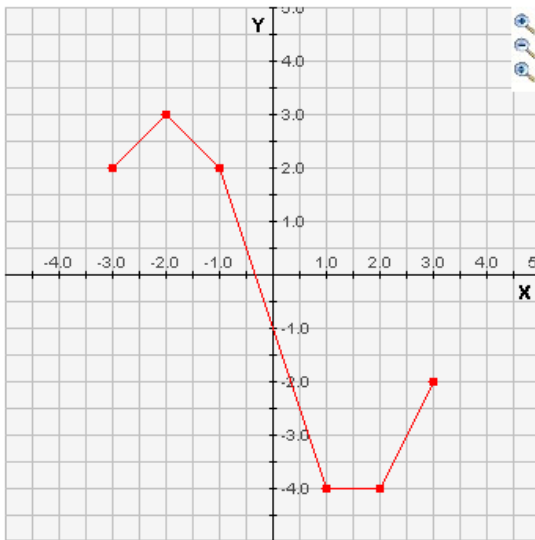
21. If $z(t) = 2t^2 + 7t - 4$, find $z(-1)$ and $z(4)$.

a) $z(-1) = -13$; $z(4) = 56$ b) $z(-1) = -9$; $z(4) = 56$
 c) $z(-1) = 5$; $z(4) = 35$ d) $z(-1) = -7$; $z(4) = 88$

22. If $f(x) = 3x^2 + 7x - 10$, find and simplify $f(2+x)$

a) $16+x$ b) $3x^2 + 2x + 16$ c) $3x^2 + 19x + 16$ d) $3x^2 + 7x - 12$

23. Use the graph of the function $f(x)$ to find the x -value for which $f(x) = 3$

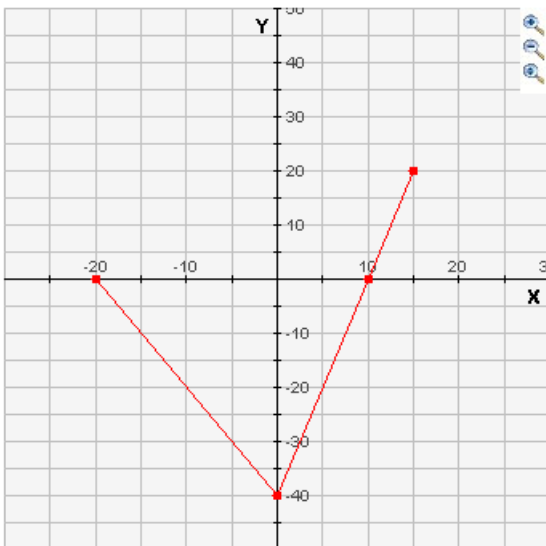


a) -1 b) 2 c) 3 d) -2

24. Which of the following is a linear function?

a) $f(x) = \frac{11}{x} + 7$ b) $f(x) = 11 + x + x^2$ c) $f(x) = \sqrt{11x+7}$ d) $f(x) = 11 - 7x$

25. What is the range of the relation whose graph is below?



- a) $\{x | -20 \leq x \leq 15\}$ b) $\{-20, -10, 0, 10, 15\}$ c) $\{y | -40 \leq y \leq 20\}$ d) $\{0, -20, -40, 20\}$

26. Find the x - and y - intercepts of the function: $g(x) = -8x - 6$

- a) (0,0) b) (0, -6) and $(-\frac{3}{4}, 0)$ c) (-6, 0) and $(0, -\frac{3}{4})$ d) (0,-6) and (14,0)

Find and write the equation of the line

27. Slope = $-\frac{1}{5}$ and y -intercept $(0, \frac{9}{8})$

- a) $y = -\frac{1}{5}(x - \frac{9}{8})$ b) $y = -\frac{1}{5}x + \frac{9}{8}$ c) $x = -\frac{1}{5}y - \frac{9}{8}$ d) $y = -\frac{1}{5}(x + \frac{9}{8})$

28. Slope = 12, goes through the point (-1, 4)

- a) $y = 12x + 4$ b) $y = 12x - 1$ c) $y = 12x + 16$ d) $y = -3x + 12$

29. Through the point (1, 10) that is parallel to the line $2y - 4x = 12$

- a) $y = 4x + 6$ b) $y = 2x + 8$ c) $2y - 4x = 10$ d) $y = 2x + 6$

30. Solve the system using the substitution method:

$$y = -29 - 3x$$

$$4x + 7y = -50$$

- a) (9, -9) b) (-9, -2) c) (-2, -9) d) (-2, 10)

Solve the system using the addition method:

$$11x + y = 69$$

31. $13x - y = 99$

- a) (7, -8) b) (4, -7) c) (-8, 7) d) There is no solution

32. $-11x - 2y = 8$
 $11x + 2y = 121$

- a) There is no solution b) $\{(x, y) | 11x + 2y = 121\}$ c) $\left(\frac{1}{2}, -\frac{3}{4}\right)$ d) (1,8)

33. At one store, 5 pairs of jeans and 2 sweatshirts costs \$230, while 3 pairs of jeans and 4 sweatshirts costs \$208. Find the cost of one sweatshirt.

- a) \$25 b) \$36 c) \$22 d) \$38

Solve the inequality. Write the answer in interval notation

34. $8 > 3x$ and $-9 + 2x \geq -14$

- a) $\left(-\infty, -\frac{5}{2}\right) \cup \left[\frac{8}{3}, \infty\right)$ b) No solution c) $\left[-\frac{8}{3}, \frac{5}{2}\right)$ d) $\left[-\frac{5}{2}, \frac{8}{3}\right)$

35. $-11 < 9 - 11z \leq 10$

- a) $\left[-\frac{1}{11}, \frac{20}{11}\right)$ b) $\left[\frac{20}{11}, -\frac{1}{11}\right)$ c) $\left[-\infty, \frac{20}{11}\right)$ d) (-20,1)

Solve the inequality, graph the solution, and write the answer in interval notation

36. $12y - 6 \geq 18$ or $y < -2$

- a) $(-\infty, -2) \cup [2, \infty)$ b) $(-\infty, -2) \cup (2, \infty)$ c) $(-\infty, -2] \cup [2, \infty)$ d) None of the above

Solve the equation

37. $2 - |3w - 18| = 8$

- a) $w = 8, w = 4$ b) $w = 4$ c) $w = 6, w = 2$ d) No solution

38. $-\frac{11}{4} + \frac{2}{3}|3y - 6| = -2$

- a) $y = \frac{13}{8}, y = \frac{19}{8}$ b) $y = 2, y = -\frac{5}{2}$ c) $y = \frac{1}{3}, y = -\frac{11}{2}$ d) No solution

Solve the inequality. Write the answer in interval notation

39. $|4w - 7| \geq 5$

- a) $\left[\frac{1}{2}, 3\right]$ b) $(-\infty, -3] \cup \left[\frac{1}{2}, \infty\right)$ c) $\left(-\infty, \frac{1}{2}\right] \cup [3, \infty)$ d) $\left[-3, -\frac{1}{2}\right]$

Solve the inequality

40. $-11 \geq |2b - 23|$

- a) $6 \leq b \leq 17$ b) $b \leq 6$ or $b \geq 17$ c) All real numbers d) No solution

Solve the inequality. Write the answer in interval notation

41. $|-2z + 4| \leq 4$

- a) $[0,4]$ b) $(-\infty,-2)$ c) All real numbers d) No solution

Write the expression by using rational exponents rather than radical notation

42. $13\sqrt[7]{x^3}$

- a) $13x^{\frac{3}{7}}$ b) $(13x)^{\frac{3}{7}}$ c) $13x^{\frac{7}{3}}$ d) $\frac{13}{x^{\frac{3}{7}}}$

Simplify the expression by using the properties of rational exponents. Write the final answer using positive exponents only.

43. $h^{\frac{10}{3}} \cdot h^{\frac{2}{3}}$

- a) $h^{\frac{20}{9}}$ b) $h^{\frac{20}{3}}$ c) h^2 d) h^4

44. $\left(\frac{81s^{12}r^{-4}}{16s^{-4}r^4}\right)^{\frac{3}{4}}$

- a) $\frac{27s^6}{8}$ b) $\frac{3s^{16}r^8}{2}$ c) $\frac{3s^{12}}{2r^6}$ d) $\frac{27s^{12}}{8r^6}$

Simplify the radical. Assume that all variables represent positive real numbers

45. $\frac{\sqrt{27z}}{\sqrt{3z}}$

- a) 3 b) $3z$ c) 9 d) $\sqrt{3z}$

46. $\sqrt{52x^5}$

- a) $2x^2\sqrt{13x}$ b) $2\sqrt{13x^5}$ c) $2x\sqrt{13x^3}$ d) $4x^4\sqrt{13x}$

47. $\sqrt[3]{72y^8}$

- a) $y^2\sqrt[3]{72y^2}$ b) $2y\sqrt[3]{9y^5}$ c) $2y^2\sqrt[3]{9y^2}$ d) $8y^6\sqrt[3]{9y^2}$

48. $\sqrt{\frac{8b^2}{2b^{12}}}$

- a) $\frac{2}{b^5}$ b) $\sqrt{\frac{4}{b^{10}}}$ c) $2\sqrt{b^{10}}$ d) $\frac{2}{b\sqrt{b^8}}$

Add, if possible

49. $7\sqrt{2} + \sqrt{98}$

- a) 28 b) 70 c) $14\sqrt{2}$ d) Cannot simplify

Multiply

50. $\sqrt{3} \cdot \sqrt{24}$

a) $\sqrt{27}$

b) $6\sqrt{2}$

c) $2\sqrt{6}$

d) $36\sqrt{2}$

51. $-4\sqrt[3]{4} \cdot 6\sqrt[3]{6}$

a) $-48\sqrt[3]{3}$

b) $-48\sqrt[3]{6}$

c) $2\sqrt[3]{10}$

d) $-192\sqrt[3]{3}$

52. $\sqrt{2}(\sqrt{8} - \sqrt{3})$

a) $4 - \sqrt{6}$

b) $4 - \sqrt{3}$

c) $2\sqrt{8} - 6$

d) $4 + \sqrt{6}$

53. $(\sqrt{12} - 1)(\sqrt{3} + 5)$

a) 1

b) $1 + 9\sqrt{3}$

c) $31 + 5\sqrt{12} - \sqrt{3}$

d) $\sqrt{33} - 5$

54. $\sqrt[4]{p^2q^3} \cdot \sqrt[3]{p^5q^2}$

a) $\sqrt[12]{p^{10}q^6}$

b) $p\sqrt[7]{q^6}$

c) $p^2q\sqrt[12]{p^2q^5}$

d) $pq\sqrt[7]{p^3q}$

Rationalize the denominator

55. $\frac{-14}{\sqrt[3]{10}}$

a) $\frac{-7\sqrt[3]{100}}{5}$

b) $\frac{5\sqrt[3]{100}}{-7}$

c) $\frac{-7\sqrt[3]{10}}{5}$

d) Cannot simplify

Answer Key

1. D
2. A
3. B
4. A
5. A
6. B
7. D
8. B
9. C
10. D
11. C
12. D
13. A
14. D
15. C
16. B
17. A
18. B
19. A

20. C
21. B
22. C
23. D
24. D
25. C
26. B
27. B
28. C
29. B
30. B
31. A
32. A
33. A
34. D
35. A
36. A
37. D
38. A

39. C
40. D
41. A
42. A
43. D
44. D
45. A
46. A
47. C
48. A
49. C
50. B
51. A
52. A
53. B
54. C
55. A