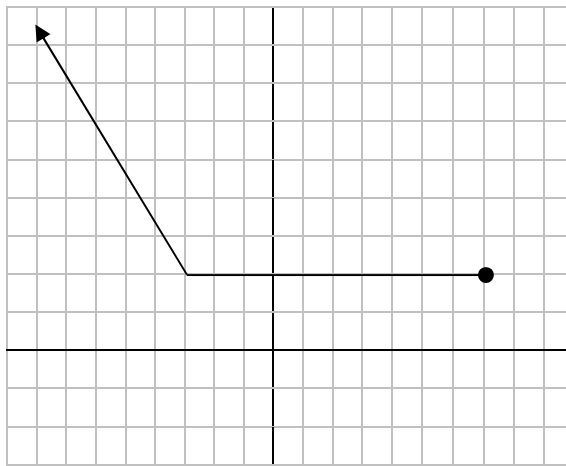


Final Exam Review

1. Simplify: $(3 - 4 \cdot 2)^2 - 4(6 - (1 + 9 \div 3))$
2. Solve: $5(x - 1) + 12 = 3x - 8$
3. Solve: $|x - 3| = 8$
4. Solve: $-1 > 2 - 3x > 14$
5. Solve: $|4x + 1| \leq 17$
6. What are the domain and range of this function? Each square equals 1 unit.



Domain:

Range:

7. What are the domain and range of this function: $y = -(x - 2)^2 + 5$
8. You are making a graph showing the relationship between the time it takes to fry an egg and the temperature of the frying pan. What is the dependent variable and what is the independent variable?
Dependent:
Independent:
9. Write the equation of the line that passes through (4, 1) and (-2, -5).
10. Write the equation of the line that contains (-3, 7) and is parallel to $y = -\frac{1}{4}x - 11$.
11. Write the equation of the line that contains (8, 11) and is perpendicular to $y = \frac{2}{3}x + 6$
12. Change the format of this line to: $(y - 8) = \frac{1}{3}(x - 6)$
 - a. slope-intercept
 - b. general form

13. Solve for x and y. $3x + 2y = 15$
 $6x - 3y = -12$

14. If $f(x) = x^2 - 5$ and $g(x) = 4x + 2$, find each of the following:

a. $f(-3) =$

b. $g(-3) =$

c. $f(g(-3)) =$

d. $g(f(-3)) =$

15. Find the vertex, x-intercept, and y-intercept of this function: $f(x) = 3x^2 - 12x + 4$

16. Solve for the real or complex roots of. $5x^2 - x + 2 = 0$ No decimal answers.

17. Simplify:

a. $(4 - 3i) - (7 + 4i)$

b. $(2 - 6i)(5 + 3i)$

Simplify.

18. $(3x^2)^4$

17. $(-3a^4 b^{-6})(5a^3 b^4)^2$

19. $\frac{(4b^4)^0 (2a^{-2} b^3)^3}{16^{1/2} a^{-4} b^{-5}}$

18. $\sqrt[4]{x^{16} y^{20}}$

19. Solve for x. $3^{2x} = 51$

20. Solve for x: $\log_2 8 = x$

21. Solve for x. $\sqrt{x+6} - x = 4$

22. Simplify: $4 \log_3 2 + \log_3 5 - \log_3 10$

23. Factor each expression completely.

a. $4x^2 - 9y^2$

b. $2x^2 - 2x - 112$

c. $6x^2 - 25x + 14$

Simplify.

24. $\frac{x^2 + 3x - 4}{x^2 - 6x + 8} \div \frac{x^2 + 8x + 16}{x^2 + 3x - 10}$

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

26. Identify any removable discontinuities or vertical asymptotes for this function: $f(x) = \frac{x^2 - 8x + 15}{x^2 + 3x - 18}$

27. Solve for x: $\frac{5x}{x + 1} - \frac{x}{x + 6} = 4$

Simplify.

28. $\sqrt{20} - \sqrt{45}$

31. $(2 + \sqrt{7})(4 - 2\sqrt{7})$

32. $\frac{7}{5 - \sqrt{2}}$

33. Solve: $9 + \sqrt{2x - 1} = 16$

34. Explain how the parent function $y = x^2$ has been transformed.

a. $y = x^2 + 4$

b. $y = (x - 5)^2 - 7$

c. $y = 4 - (x + 2)^2$

35. Write the equation of a circle that has a center at $(-5, 8)$ and a radius of 7.

36. Determine if each sequence is arithmetic, geometric, or neither.

a. 1800, 1200, 800, ...

b. 25, 21, 18, 16, ...

c. 14.6, 12.3, 10, ...

37. Find the sum: $\sum_{j=1}^5 3j + 1$
38. Use factorials to write an expression equal to: $99 \times 98 \times 97$
39. Find the following values:
- $5!$
 - ${}_9P_3$
 - ${}_6C_4$
40. How many ways can you arrange the letters in the word FINALS, such that:
- all letters are used and no letters are repeated?
 - four letters are used and no letters are repeated?
 - four letters are used, the word starts with an L and ends with a vowel.
41. There are 4 cats and 3 dogs waiting at the vet's office. The vet's office has three exam rooms. How many ways could they select:
- 2 cats and 1 dog?
 - 3 cats?
 - If they randomly selected the animals, what is the probability that there would be at least 2 cats in the exam rooms?
42. 9. Donald has a 28% chance of going to Disneyland. Daisy has a 64% chance of going to Disneyland. Calculate the probabilities of the following:
- Donald not going to Disneyland, $P(\text{no Disney for Donald}) =$
 - Daisy not going to Disney, $P(\text{no Disney for Daisy}) =$
 - neither one going to Disneyland, $P(\text{no Disney for both}) =$
 - both go to Disneyland, $P(\text{Disney for both}) =$
 - only one of them going, $P(\text{only one goes}) =$