

ALGEBRA 1

Exam 12

Based on Chapter 12 (pages 762-835) in your textbook.

Student's Name _____ Student Number _____

Street _____ City _____ State _____ Zip Code _____

BE SURE YOU FULLY UNDERSTAND ALL CHECKPOINT PROBLEMS FROM THIS CHAPTER BEFORE YOU COMPLETE THIS EXAM. **SHOW AS MUCH WORK AS POSSIBLE.**

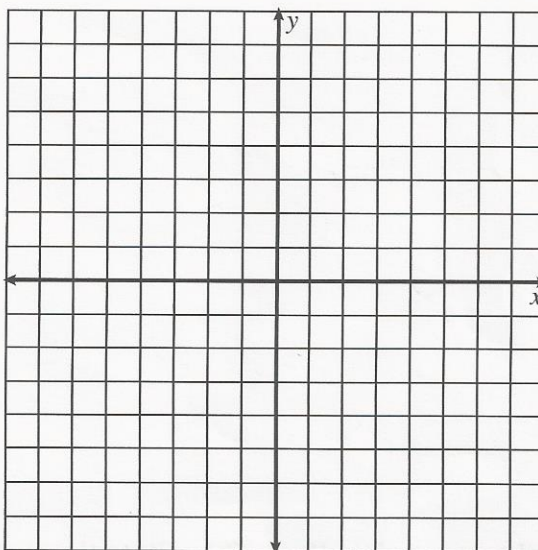
Graph each function; identify the domain and range; and compare the graph with the graph of $y = \frac{1}{x}$.

1. $y = \frac{-10}{x}$

Domain:

Range:

Compare:

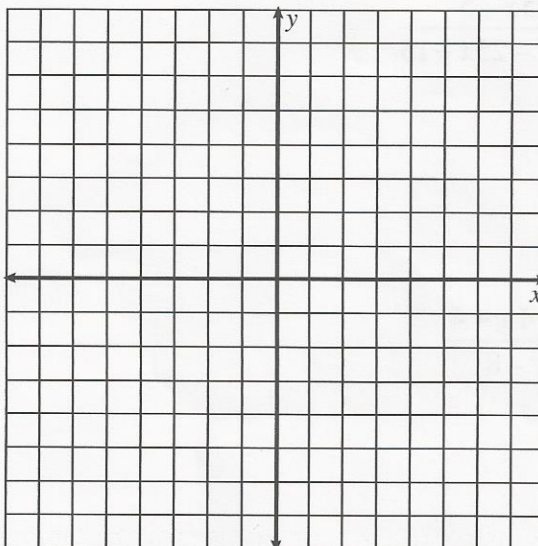


2. $y = \frac{1}{x+3} + 3$

Domain:

Range:

Compare:



Simplify using long division. (Remember to show all your work.)

3. $(-72 - 4x^2 + 8x^3 - 36x) \div (x - 3)$ 4. $(8b^3 - 6) \div (2b - 1)$

Simplify the expression, if possible. State the excluded values, if any.

5. $\frac{5x - 5}{10x^2 - 25x + 15}$

6. $\frac{w^2 + 4w + 4}{2w^2 - 8}$

(more)

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Simplify the expressions and solve the equations.

7. $\frac{v^2 + 6v + 8}{v^2 + v - 12} \div \frac{v + 2}{2v - 6}$

8. $\frac{2}{b-2} = \frac{b}{b^2 - 3b + 2} + \frac{b}{2b-2}$

9. $\frac{1}{x-2} + \frac{2x}{(x-2)(x-8)} = \frac{x}{2(x-8)}$

10. $\left(\frac{m^2 + 2m + 1}{m^3 + 3m^2 + 3m + 1} \right) \left(\frac{m^2}{m} - \frac{3m}{3} \right)$

Describe and correct the error.

$$11. \frac{3}{x} + \frac{6}{x+3} = \frac{8}{x+1}$$

$$\text{LCD} = x(x+3)(x+1)$$

$$3(x+3)(x+1) + 6x(x+1) = 8$$

$$3(x^2 + 4x + 3) + 6x^2 + 6x = 8$$

$$3x^2 + 12x + 9 + 6x^2 + 6x = 8$$

$$9x^2 + 18x + 1 = 0$$

$$x = \frac{-18 \pm \sqrt{18^2 - 4(9)(1)}}{2(9)}$$

$$= \frac{\sqrt{-18 \pm \sqrt{288}}}{18} = \frac{-18 \pm 12\sqrt{2}}{18}$$

$$x = \frac{-3 \pm 2\sqrt{2}}{3}$$

$$12. \frac{r^2 - 7r + 12}{r + 4} \div \frac{r^2 - 7r + 12}{r^2 + 6r + 8}$$

$$= \frac{(r-3)(r-4)}{r+4} \div \frac{(r-4)(r-3)}{(r+2)(r+4)}$$

$$= \frac{r+4}{(r-3)(r-4)} \cdot \frac{(r-4)(r-3)}{(r+2)(r+4)}$$

$$= \frac{1}{r+2}$$

(more)

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Complete the following word problems.

13. Tell whether the table represents inverse variation. If so, write the inverse variation equation and solve for y when $x = 4$. Show work that supports your conclusions.

Amperes (x)	Ohms (y)
310	.04
124	.1
62	.2
15.5	.8

14. It takes 7 hours for Isabella to rake leaves by herself, but her brother Matthew can work three times as fast. If they work together, how long will it take them to rake leaves?

	Rate	Time	Work Done
Isabella			
Matthew			

15. Madison is making a vinaigrette for her catering service using olive oil that costs fifty cent per ounce and apple cider vinegar that costs thirty-five cents an ounce. The ideal batch of vinaigrette has 25% vinegar. If she has already combined 3 cups of vinegar and 1 cup of oil, how many cups of oil should she add? What is the total cost of her completed recipe?

Amount (oz)	Cost (\$)
10	5.00
5	2.50
2	1.00
1	0.50

16. The projected cost of a new high school is \$20,066,340, of which \$5,216,340 will be covered by available grants. Using data from the last census, the planning committee estimated the cost per town resident. However, new census data reveals that the population has increased by 2200 people, reducing the cost per town resident by \$75. What is the current population of the town?

Year	Population	Cost (\$)
2000	10,000	2,000,000
2010	12,200	1,650,000

(more)

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Emily rows six miles downstream in 1 hour and her friend Ashley, rowing 1 mile per hour faster, completes the return trip in 2 hours.

17. Find the speed of the current (c) and each girl's rowing speed.

18. If Emily and Ashley were rowing separately, who would complete their trip first and by how long? Round to the nearest hundredth, if necessary.

FILL IN YOUR NAME AND THE OTHER REQUIRED INFORMATION ON EACH PAGE
OF THE EXAM AND MAIL THE EXAM TO THE SCHOOL.

Use this page if you need more room to show your work.

16. Emily rowed a motorboat upstream in 1 hour and her friend Ashley, rowing 1 mile per hour faster, completed the return trip in 2 hours.

17. Find the speed of the current (c) and each girl's rowing speed.

18. If Emily and Ashley were rowing separately, who would complete their trip first and by how long? Round to the nearest tenth of an hour, if necessary.

Put in your name and the other required information on each page of the exam and mail the exam to the school.