

You have 2hr 15min. Answer each non-graph question neatly on the line provided.

Name: \_\_\_\_\_

ID: \_\_\_\_\_

1. (4 points) Simplify  $\frac{3}{2} + \frac{3}{8} - \frac{1}{4}$  completely.

1. \_\_\_\_\_

2. (4 points) Simplify  $\frac{(2a^4a^2)^3}{a^{-2}}$  completely.

2. \_\_\_\_\_

3. (4 points) Evaluate  $(\frac{25}{9})^{-\frac{3}{2}}$  and simplify completely.

3. \_\_\_\_\_

4. (4 points) Sketch the graph of  $f(x) = 2^{x+1} + 3$ . Label all asymptotes on your graph for full credit.

5. (4 points) Perform the division  $\frac{x^2-36}{x^2-16} \div \frac{2x+12}{x-4}$ .

5. \_\_\_\_\_

6. (4 points) Perform the addition  $\frac{2}{x+8} + \frac{1}{x^2-64}$  and simplify completely.

6. \_\_\_\_\_

7. (4 points) Find all solutions  $x$  to  $4(x+8)+1 = -3(x-2)-1$ .

7. \_\_\_\_\_

8. (4 points) Sketch the graph of the piecewise function  $f(x) = \begin{cases} 2 & \text{if } x < -1 \\ 5 - x^2 & \text{if } x \geq -1 \end{cases}$

9. (4 points) A gas station sells regular gas for \$3.60 per gallon and premium gas for \$4.00 a gallon. At the end of a business day 185 gallons of gas have been sold, and receipts totaled \$690. How many types of each gallon had been sold?

9. \_\_\_\_\_

10. (4 points) Find an equation of the line that passes through the points  $(-1, -2)$  and  $(7, 6)$ .

10. \_\_\_\_\_

11. (4 points) Find all real solutions of  $x^3 - 12x^2 + 32x = 0$ .

11. \_\_\_\_\_

12. (4 points) Sketch the graph of  $y = -|x + 10|$ .

13. (4 points) Solve  $x + 4 < 2(8 - 2x)$  for  $x$ . Express your answer using interval notation.

13. \_\_\_\_\_

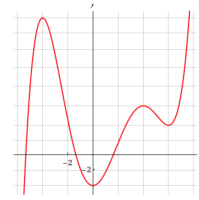
14. (4 points) Use  $f(x) = x + 2$  and  $g(x) = 4 - x^2$  to evaluate  $(g \circ f)(x)$ . Simplify your answer.

14. \_\_\_\_\_

15. (4 points) Find the net change of  $f(t) = \frac{2}{t}$  between  $t = \frac{-1}{4}$  and  $t = \frac{1}{2}$ .

15. \_\_\_\_\_

16. (4 points) Sketch the graph of  $g(x) = -x^2 + 2x$ . Label the vertex on your graph for full credit.



17. (4 points) Find the range of the following function whose graph is given. Express your answer in interval notation on the answer line.

17. \_\_\_\_\_

18. (4 points) Evaluate and simplify  $f(10 + h) - f(10)$  when  $f(x) = 2x^2 + 5$ .

18. \_\_\_\_\_

<b><math>x</math></b>	1	2	3	4	5	6
<b><math>f(x)</math></b>	2	3	5	1	6	3
<b><math>g(x)</math></b>	3	4	1	5	2	6

19. (4 points) Use the table to evaluate  $g(f(2))$

19. \_\_\_\_\_

20. (4 points) Solve  $wd = 2rTH$  for  $r$

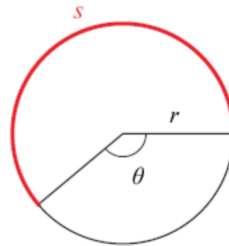
20. \_\_\_\_\_

21. (4 points) Evaluate  $\log_4\left(\frac{1}{16}\right)$ .

21. \_\_\_\_\_

22. (4 points) Solve  $\log_x 16 = 4$  for  $x$ .

22. \_\_\_\_\_



23. (4 points) Find the length  $s$  of the circular arc

when  $r = 8$  and  $\theta = 120^\circ$ .

23. \_\_\_\_\_

24. (4 points) A 22-ft ladder leans against a building so that the angle between the ground and the ladder is  $60^\circ$ . How high does the ladder reach on the building?

24. \_\_\_\_\_

25. (4 points) Evaluate  $\cos\left(\frac{7\pi}{6}\right)$ .

25. \_\_\_\_\_