

You have 1hr 40min. Answer each non-graph question neatly on the line provided.

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

1. (5 points) Simplify  $2(3 + \frac{7}{8}) - \frac{1}{3}$ .

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

2. (5 points) Simplify  $(\frac{2a^{-1}b}{a^2b^{-8}})^4$  and eliminate negative exponents.

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

3. (5 points) Evaluate  $27^{-\frac{4}{3}}$ .

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

4. (5 points) Factor  $-5x^3 + 20x$  completely.

4. \_\_\_\_\_

5. (5 points) Perform the multiplication  $\frac{2x^2-50}{x^2-16} \cdot \frac{3x+12}{x+5}$  and simplify.

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

6. (5 points) Perform the addition  $1 - \frac{x+1}{x+9}$  and simplify as one fraction.

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

7. (5 points) Find all solution  $x$  of  $2x^2 = 32$

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

8. (5 points) Solve the equation  $PV = nRT$  for  $R$ .

8. \_\_\_\_\_

9. (5 points) Solve the inequality  $x^2 + 4x - 5 < 0$ . Express your answer using interval notation.

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

10. (5 points) Find the radius of the circle  $x^2 + 10x + y^2 = 0$

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

11. (5 points) Find the y-intercept of the line through the points  $P(6, -6)$  and  $Q(8, -1)$ .

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

12. (5 points) Evaluate and simplify  $h(2a - 1)$  when  $h(x) = \frac{x^2+1}{2}$ .

12. \_\_\_\_\_

13. (5 points) Find the domain of  $f(t) = -\sqrt{2t - 9}$ . Express your answer in interval notation.

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

14. (5 points) Use the graph of  $f$  (no pic here) to find the intervals on which  $f$  is decreasing.

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

15. (5 points) Determine the net change of  $r$  between  $t = 4$  and  $t = 8$  when  $r(t) = 4 - \frac{t}{4}$ .

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

16. (5 points) Evaluate  $f(g(10))$  when  $f(x) = 2x - 3$  and  $g(x) = 6 - x^2$ .

16. \_\_\_\_\_

17. (5 points) Evaluate  $f^{-1}(-23)$  when  $f(x) = 7 - 5x$ .

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

18. (5 points) Sketch the graph  $y = |x + 10| - 3$  not by plotting points but by transforming a known graph. Label all intercepts on your sketch. State the domain and range using interval notation.

19. (5 points) Sketch the graph  $f(x) = -(x+1)^2$  not by plotting points but by transforming a known graph. Label all intercepts on your sketch. State the domain and range using interval notation.

20. (5 points) Sketch the graph  $g(x) = x - |x|$  by making a table of values.