

Answer each question neatly on the line provided.

Name: _____

ID: _____

1. (5 points) Perform the indicated operations $(6 + \frac{1}{3})(\frac{1}{2} - \frac{3}{4})$ and simplify completely as one fraction.

1. _____

2. (5 points) True or False: $\frac{9}{40} \geq \frac{4}{9}$.

2. _____

3. (5 points) Evaluate $(\frac{2}{5})^{-3}$ and simplify completely without negative exponents.

3. _____

4. (5 points) Factor $2x^2 - 2x - 24$ completely.

4. _____

5. (5 points) Perform the operations $x^{\frac{3}{2}}(10\sqrt{x} + \frac{2}{\sqrt{x}})$ and simplify.

5. _____

6. (5 points) Expand $(\sqrt{u} + \frac{1}{\sqrt{u}})^2$ and simplify completely.

6. _____

7. (5 points) Find the domain $\frac{\sqrt{x-4}}{x^2-25}$.

7. _____

8. (5 points) Simplify $(-7z^5)^2(3z^3)$ and eliminate any negative exponents.

8. _____

9. (5 points) Perform the operation $\frac{x^2+2x-15}{x^2-2x-15} \cdot \frac{5-x}{x+5}$ and simplify completely.

9. _____

10. (5 points) Add $\frac{3x}{x^2-16} + \frac{1}{x-4}$ and then simplify as one reduced fraction.

10. _____

11. (5 points) Solve $4x^2 - 156 = 0$.

11. _____

12. (5 points) Find all real solutions x to $\sqrt{4x - 2} = 2$.

12. _____

13. (5 points) Solve $|3x + 4| = 1$.

13. _____

14. (5 points) Solve $\frac{4}{x} < x$. Express your answer in interval notation.

14. _____

15. (5 points) Sketch the graph of the piecewise defined function

$$f(x) = \begin{cases} 3x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

16. (5 points) Find an equation of the line passing through the points $(-1, 2)$ and parallel to the x-axis.

16. _____

17. (5 points) Find an equation of the circle with center at the origin that passes through $(4, 7)$.

17. _____

18. (5 points) Find the net change of $f(x) = \frac{1}{x}$ between $x = -1$ and $x = -1 + h$.

18. _____



19. (5 points) Use the graph of f to find its average rate of change between $x = 0$ and $x = 3$.

19. _____

20. (5 points) Make a rough sketch of the graph $y = \frac{x}{|x|}$.