

## Practice Problems for MTE 7 – Rational Expressions and Equations

1. Identify all the values of  $x$  that make this expression undefined.  $\frac{x-3}{4x-7}$

2. Identify all the values of  $x$  that make this expression undefined.  $\frac{v-2}{v^2-7v+12}$

3. Rewrite this expression without negative exponents.  $a^{-4}b^2c^{-2}$

4. Simplify.  $\frac{2x-6}{4x-12}$

5. Given  $p = 2$  and  $t = -3$ ,

evaluate.  $\frac{p^2-t^2}{4p+4t}$

6. Perform the indicated operations and simplify.

$$\frac{w}{w^2-6w-7} + \frac{-7}{w^2-6w-7}$$

7. Identify the Least Common Denominator of the two rational expressions.

$$\frac{4}{x-2} \text{ and } \frac{6}{x+2}$$

8. Perform the indicated operations and simplify.

$$\frac{4}{x-2} - \frac{6}{x+2}$$

9. Perform the indicated operations and simplify.

$$\frac{1}{7y} + \frac{2}{9y^2}$$

10. Perform the indicated operations and simplify.

$$\frac{m+7}{m^2+7m+6} + \frac{2m+1}{m^2+5m+4}$$

11. Perform the indicated operations and simplify.

$$\frac{x^2-x}{x^2-6x+8} \cdot \frac{x-4}{x^2+4x} \div \frac{4x}{x^2-6x+8}$$

12. Perform the indicated operations and simplify.

$$\frac{8}{4-5p} - \frac{2}{5p-4} + \frac{p-4}{5p^2+16p-16}$$

13. Simplify.

$$\frac{\frac{w}{6w-7}}{\frac{w^2}{12w-17}}$$

14. Simplify.

$$\frac{\frac{w}{w^2-6w-7} + \frac{-7}{w^2-6w-7}}{\frac{w}{w^2-2w-3} - \frac{4}{w^2-2w-3}}$$

15. Divide:

$$\frac{18j^4 + 45j^2 + 27j}{3j}$$

16. Use long division to find the quotient and express the remainder (if any) as a fraction.  
 $(20p^3 + 17p^2 + 26p + 50) \div (4p + 5)$

17. Solve.  $\frac{4}{x-2} = 1 + \frac{6}{x+2}$

18. The current in the Red Cedar River is 6 mph. A canoe can travel 7 miles downstream in the same time that it takes to travel 3 miles upstream when paddled at the same rate. Set up (but do not solve) a rational equation that could be used to find the rate the canoe is paddled, using  $x$  as this rate.

19. A loaded moving truck is traveling 30 mph faster than a freight train. In the time it takes the train to travel 135 miles, the truck travels 225 miles. Find the speed of the truck.

20. To estimate the number of fish in a lake, a park ranger catches 220 fish, tags them, and returns them to the lake. Later, 72 fish are caught, and it is found that 20 of them are tagged. Estimate the number of fish in the lake.

21. Source of Heat A will melt a pound of ice in 2 hours and Source of Heat B will melt a pound of ice in 5 hours. How long will it take to melt a pound of ice if both sources are used at the same time?