Rational Expressions and Equations: Chapter 4

Practice Questions

1. A non-permissible value for a rational expression is a value for the variable that makes the: A) numerator equal to zero. B) expression equal to zero. C) denominator equal to zero. D) numerator and denominator both equal to zero.	C
2. Simplify the following expression $\frac{18ab + 21b}{6ab^2}$ A) $\frac{6a + 7}{2ab}$ B) $\frac{6ab + 7b}{2ab^2}$ C) 5 D) $\frac{3ab + 21b}{b}$	A

3. Sam is given two rational expressions with an operation symbol between the two. To perform the operation, Sam erases the operation symbol and the second rational expression and replaces the second rational expression with its reciprocal. Assuming Sam has begun to correctly perform the given operation, the student should replace the original operation symbol with: A) + B) – C) × D) ÷	C
4. Which of the following rational equations has non-permissible values of 0, 3 and 5? A) $\frac{1}{x}+3=\frac{5}{x}$ B) $\frac{3}{x}-\frac{2}{x-5}=\frac{x-3}{2}$ C) $\frac{2}{7}-\frac{3}{x-3}=\frac{x}{x-5}$ D) $\frac{x-2}{x^2}-\frac{3}{x-3}+\frac{2}{x-5}=\frac{7}{x}$	D

5. The non-permissible values of x for the expression $\frac{x+3}{x-4} \div \frac{x}{x-3}$ are A) -3, 0, 3, and 4 B) 0, 3, and 4 C) 0 and 4 D) 3 and 4	B
6. The result of $\frac{4x^2+1}{x-3} - \frac{3x^2+10}{x-3}$, in simplified form, is: A) $x + 3, x \neq 3$ B) $x - 3, x \neq 3$ C) $\frac{1}{x-3}, x \neq 3$ D) $\frac{x^2+11}{x-3}, x \neq 3$	A
7. When adding $\frac{x^2+3}{x-5} + \frac{2x^2-9}{x-5}$: A) add the numerators only. B) add the numerators and add the denominators. C) express both expressions with a denominator of $(x-5)^2$ and then add the numerators only. D) multiply the numerator of each expression by $(x-5)$ and then add the numerators and denominators.	A

8. When subtracting rational expressions with different binomial denominators of the form $x - a$, the lowest common denominator is the: A) sum of the binomials. B) product of the binomials. C) quotient of the binomials. D) difference between the binomials.	B
9. What **could** be the solutions to the rational equation shown below, where *a*, *b*, *c*, *d*, *e*, and *f* are natural numbers? $\frac{a}{x-b}-\frac{c}{x+d}=\frac{e}{f}$ A) $x = b, e$ B) $x = -b, -d$ C) $x = c, -d$ D) $x = a, d$	D
10. The simplified product of $\frac{2n^4 p}{3m}\cdot\frac{6m^6}{3n^2 p^2}$ can be represented by $\frac{An^B m^C}{3p}$ where A, B, and C represent single digit numbers. In the simplified product $\frac{An^B m^C}{3p}$ the value of **A** is__________ **B** is __________ **C** is __________	4 2 5

11. Determine the solution of the equation $\frac{3}{x+2}-\frac{1}{x}=\frac{1}{5x}$, to the nearest tenth. ________	1.3
12. The speed of a train is five times as great as the speed of a scooter. The scooter takes 4 hours longer than the train to travel 400 km. If the speed of the scooter is given by *x*, which of the following equations correctly models the given scenario? A) $\frac{400}{6x}=4$ B) $\frac{400}{x}-\frac{400}{5x}=4$ C) $\frac{400}{x}+\frac{400}{5x}=4$ D) $\frac{400}{5x}-\frac{400}{x}=4$	B

13. Use the following information to answer the question.	D

Ken made an error in the simplification of the rational expression $\frac{2x+10}{2x^2-50}$, $x \neq -5, 5$. His simplification of the expression is shown below.

Step 1 $\frac{{}^{1}\not{2}(x+5)}{{}^{1}\not{2}(x^2-25)}$

Step 2 $\frac{1(x+5)}{1(x+5)(x-5)}$

Step 3 $\frac{1\cancel{(x+5)}}{1\cancel{(x+5)}(x-5)}$

Step 4 $(x-5)$, $x \neq -5, 5$

The step in which Ken made his error is

A. Step 1
B. Step 2
C. Step 3
D. Step 4

14. The area of a rectangle can be modelled by the rational equation $\frac{4x}{x-1} \bullet \frac{x+4}{x+1} = 16$, where $x > 1$. Determine the solution for x to this equation.	2

15. When the rational expression $\frac{2x+4}{x^2-4}$ is simplified, the equivalent expression can be written in the form $\frac{2}{A}, x \neq B$.	16

Expressions for ***A*** and ***B*** that would correctly complete the simplified form can be selected from the table below.

Code	Possibilities for *A*
1	$x-2$
2	$x+2$
3	x

Code	Possibilities for *B*
4	–2
5	0
6	–2, 2
7	–2, 0, 2

To form a correct equivalent expression, the code for AB is ___.

16. In parallel circuits, the total resistance of a circuit, R_T, is determined by the formula $\frac{1}{R_T}=\frac{1}{R_1}+\frac{1}{R_2}$, where R_1 is the resistance of one branch of the circuit, and R_2 is the resistance of the other branch of the circuit.

Answer: D

In a particular parallel circuit, one branch has 3 ohms more resistance than the other. This can be modelled by the equation $\frac{1}{R_T}=\frac{1}{x}+\frac{1}{x+3}$ where x is the resistance of the unknown branch.

An expression for the total resistance, R_T, of this circuit in terms of x is

A. $R_T=\frac{5}{x+3}$

B. $R_T=\frac{2}{2x+3}$

C. $R_T=\frac{2x+3}{x+3}$

D. $R_T=\frac{x(x+3)}{2x+3}$