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Name: _____ Date: _____

[4] 1. State all non-permissible values for given expressions:

$\frac{19x^3 + 2x^2 + 1}{12x^2 - 4x}$	$\frac{156x^5 + x}{19xz^4}$
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[4] 2. Circle expressions that are rational:

$\frac{1.9x}{x^{67}}$	$\frac{\sqrt{18}xy^3}{x^5}$	$\frac{\sqrt{-5}}{2}(x^2 - x^9)$	$\frac{3x^9 - 0.5x^{0.3}}{5x + 1}$
$\frac{10^6 + 15}{\sqrt{b^2}}$	36	$\frac{2y^7 - 4y^3}{y - \sqrt{26}}$	$39x^{-4}$

[4] 3. State restrictions on the variable for each given expression:

$\frac{x^2 - 7x + 12}{-x^2 + 144}$	$\frac{x + 5}{x - 164}$
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[3] 4. Two consecutive numbers are represented by x and $x+1$. If four is added to the first number and four is subtracted from the second number, the quotient of the new numbers is 4.5. Determine the numbers algebraically.

[8] 5. Simplify for all permissible values. Clearly identify your final answer.

$$\frac{4x + 12}{x^2 + 5x + 6} - \frac{2x - 2}{4x^2 + 4x - 8}$$

$$\frac{x + 5}{x^2 + 10x + 25} - \frac{2x + 14}{x^2 + 3x - 28}$$

$$\frac{\frac{1}{5} + x}{x - \frac{1}{5}}$$

$$\frac{a^2 - 2a - 15}{64 - a^2} \div \frac{a - 5}{a + 8}$$

- [3] 6. The speed of a stream is 5.1 km/h. If a boat travels 52.25 km downstream in the same time that it takes to travel 32 km upstream, what is the speed of the boat in still water? Answer in a full sentence to the nearest hundredth.

- [3] B 7. The difference of two *integers* is 14. The sum of their reciprocals is $\frac{20}{51}$. What are the numbers?

[10] **8. Fill in the blanks so the statements are true.**

a) All rational expressions can be expressed as _____ with a polynomial in _____ and a polynomial in _____.

b) Every term in a polynomial consist of a coefficient that is a real number and at least one variable. This variable has to be raised to an exponent that is _____.

c) A term that has a variable raised to the power of zero is called _____.

d) _____ numbers are not permitted as coefficients in polynomials.

e) A restriction on a variable is necessary because it ensure that the expression is _____.

f) _____ leads to an undefined rational expression because it makes _____ equal to _____.

[8] **9. Clearly state whether the given statement is true or false. If the statement is false, correct it so it is true.**

	Every rational expression has at least one non-permissible value.
	Factoring as an effective method for simplifying rational expressions.
	$y^4 - z^6$ cannot be factored as a difference of squares.
	$(-6 + x)$ and $(6 + x)$ are conjugates of one another.
	All trinomials can be factored by inspection.
	A common denominator is required to subtract and divide rational expressions.
	A radical is not permitted in a rational expression.
	A binomial in the denominator of a rational expression will always result in exactly one non-permissible value.

[6]

10. State the value of the variable for which each equation is undefined. Solve the equation. Check your answer.

$\frac{5a}{12} = \frac{15}{2a}$	
$\frac{2m+3}{m+3} + \frac{1}{2} = \frac{m+1}{m-1}$	

