

Math 105 Exam 1 Review

NAME: _____

Please write all your solutions neatly as shown in the videos/book, or the class to receive full credit. The exam may receive zero credit if the directions are not followed.

1. List, if possible, a rational and an irrational number between the irrational number $3.454554555 \dots$ and the rational number $4.4\bar{5}$ (2 points)

Rational Number _____

Irrational Number _____

2. Fill the chart below. (9 points)

For each column check all the labels that apply.	-12	$\frac{25}{15}$	$7 - 3i$	$\sqrt{2}$	$2.0\bar{2}3$	$\sqrt{9}$
A. Whole Number						
B. Integer						
C. Rational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Real Number						
E. Complex Number						

3. Evaluate each radical. Your answer should just be a number (real or complex) without any exponent or radical remaining. (6 points)

a. $\sqrt{-9}$

b. $\frac{1}{\sqrt{25}}$

c. $\sqrt[3]{-27}$

4. If $f(x) = x^2$, then evaluate (4 points)

a. $f(-3) =$

b. $f(a + 2) =$ (just give an expression and don't simplify)

5. Plot the following numbers on the number line below. Use appropriate tick marks so that each number lands on its own tick mark. (4 points)

$-1\frac{5}{6}$, $\frac{3}{2}$, $\frac{4}{3}$, $2\frac{1}{3}$



6. Can there be a carryover of more than 1 when adding two decimal numbers? Explain why or why not. (4 points)
7. What properties allow us to add numbers in any order we want? For example, if we had the problem $2 + 9 + 6 + 8 + 1 + 4$, I could add the numbers in the order shown below to get my answer. Explain your answer. (5 points)
 $(2 + 8) + (9 + 1) + (6 + 4) = 10 + 10 + 10 = 30$
8. Answer True or False, and justify your answer. (15 points)
- a. $-(-3)^2 = 9$
- b. $-5^{-\frac{1}{2}} = -\sqrt{5}$
- c. Is $2 \times (3 \times 5) = (2 \times 3) \times (2 \times 5)$?
- d. Is $2 + (3 + 5) = (2 + 3) \times (2 + 5)$?
- e. Is $(x + y)^2 = x^2 + y^2$?

9. Fill the chart below. When you evaluate the expression please so that there are no negative exponents and that each base appears only once.

(4 points each)

	Expression or Number	Write in words, how you would read the expression or the number.	Base	Exponent	Simplified Expression or Number
a.	-3^2				
b.	3^{-2}				
c.	$9^{\frac{1}{2}}$				
d.	$\frac{1}{8^{-\frac{1}{3}}}$				
e.	-719^0				
f.	$\left(\frac{x^3}{x^{-2}}\right)^{-2}$				

10. Perform each addition or subtraction problem. (Combine "Like" terms, watch of like units). (15 points)

For My eyes Only

a. $\frac{2}{x+1} - \frac{5x-1}{x-2}$

b. $(8 - 7i) - (-2 + 5i)$

c. $12\sqrt{2x-1} + 7\sqrt[3]{2a^2b} - 5\sqrt{2x+1} + 5\sqrt[3]{2a^2b} - 3\sqrt{2x-1}$

11. Draw a strip diagram (use a rectangle) to show the percentage $66.\bar{6}\%$. (2 points)

12. Perform the operations below showing all of your work without a calculator. (4 points)

a. 0.45×8.3

b. $7\frac{1}{2} + 2\frac{3}{4}$

13. Use the distributive property of multiplication over addition or subtraction to perform the multiplications below. Combine "Like" terms in the final answer. (4 points)

a. $(2x - 3)(3x^2 + 5x - 3)$

b. $(2x + 3)^2$

14. Convert the written description into an algebraic expression for the number of marbles Anu has compared to the number of marbles Jain has. Use appropriate variables when necessary. Anu has four more than twice the marbles Jain has. (2 points)

Number of marbles Jain has: _____

Number marbles Anu has: _____