

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. (12 points)

For each column check all the labels that apply.	-12	$\frac{25}{15}$	$7 - 3i$	$\sqrt{2}$	$2.0\bar{23}$	$\sqrt{9}$
A. Whole Number						
B. Integer						
C. Rational Irrational	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<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. The numbers below are multiplied or divided by powers of ten. Write them as decimal numbers showing clearly where the decimal point moves to. (2 pts)

a. $678.5 \div 100000 =$ _____

b. $678.5 \times 1000 =$ _____

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

a. $\sqrt{-16}$

b. $\frac{1}{\sqrt{4}}$

c. $\sqrt[3]{-8}$

5. If $f(x) = x^2 - 5$, then evaluate (4 points)

a. $f(-2) =$

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

6. 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.	$16^{\frac{1}{2}}$				
d.	$\frac{1}{27^{-\frac{1}{3}}}$				
e.	-8719^0				
f.	x^5x^3				
g.	$\frac{x^8}{x^2}$				
h.	$\left(\frac{x^3}{x^{-2}}\right)^{-2}$				

7. Plot the following numbers on the number line below. Use appropriate tick marks so that each number lands on its own tick mark. (8 points)

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



8. Answer True or False and justify your answer. (4 points)

a. $-(-5)^2 = 25$

b. $-3^{-\frac{1}{2}} = -\sqrt{3}$

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

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

a. 0.45×8.3

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

11. Perform each addition or subtraction problem. (Combine "Like" terms). (3 points each)

a. $(2x^2 - 3x - 5) - (5x^2 - 8)$

b. $\frac{7}{x-1} - \frac{5x-5}{x+4}$

c. $(3 - 7i) - (-5 - 5i)$

d. $6\sqrt{2x+1} + 5\sqrt[3]{2} - 2\sqrt{2x+1} + 4\sqrt[3]{2} - 2\sqrt{2x-1}$

For My eyes Only

For My eyes Only

12. Use the distributive property of multiplication over addition or subtraction to perform the multiplications below. Combine "Like" terms in the final answer. (6 points)

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

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

13. 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: _____

14. Use order of operations to simplify. Write your answer in the simplest form. (4 points)

$$\frac{-5 + (2 - 5)^2 + 3 \times 2}{2^2 - 3 \times (4 - 2)}$$

15. For each number in the left column, state whether it is less than, equal to, or greater than the number at the top of each column. Follow the example in the first row. (12 pts)

	$-2^{-\frac{1}{2}}$	2^2	-2^2	$\frac{1}{\sqrt{4}}$	$2\sqrt{2}$	$\frac{1}{2^{-\frac{1}{2}}}$
$\sqrt{2}$						
$\frac{1}{2^2}$						
-4						
$\sqrt{8}$						
$2^{-\frac{1}{2}}$						
$-\frac{1}{2^{-\frac{1}{2}}}$						
$\frac{1}{2}$						
$-\frac{1}{2^{-2}}$						

10. 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
i.	-3^2				
j.	3^{-2}				
k.	$9^{\frac{1}{2}}$				
l.	$\frac{1}{8^{-\frac{1}{3}}}$				
m.	-719^0				
n.	$\left(\frac{x^3}{x^{-2}}\right)^{-2}$				