$\qquad$
Date: $\qquad$

Note:

You can get partial credit when you demonstrate correct ideas and thought processes.
This test is 200 points $=100 \%$. There are 15 bonus points built into the scoring of this test.
You may use any type of calculator on this test. You may not use your phone.
You may use a 3 -inch by 5 -inch index card with notes on it.

I expect most students to take about 2 hours to complete this test, you are allowed up to 3 hours. Be aware of your start time and the closing time at the testing center you are at.

1) Evaluate the following expressions. Simplify your answers. (hint: remember your order of operations) (5 pts each)
a. $2.5 \div 25$
b. $20-5 \div 5$
c. $5 \cdot 2^{3}-8 \div 2^{2}$
d. $-23-(-10)$
e. $3+2\left[16-3\left(14-3^{2}\right)+1\right]$
2) Find the LCM (Least Common Multiple) for each of the following. (5 pts each)
a. $\{4,6,9\}$ LCM =
b. $\{12,16,20\}$
$\mathrm{LCM}=$
3) The product of two numbers is 20 . If one of the numbers is 4 . What is the other number? ( 5 pts )
4) Evaluate the following expressions. If the answer is a fraction write it in lowest terms. (5 pts each)
a. $\frac{3}{7}+\frac{9}{7}$
b. $\frac{1}{6}-\frac{2}{9}$
c. $-1-\left(\frac{3}{5}\right)$
5) Cindy's income is $\$ 1800$ per month. She plans to budget $1 / 4$ of her income for rent and $20 \%$ of her income for electricity. How much of her income will she have left? ( 5 pts )
6) Evaluate the following expressions when $x=2$ and $y=-3$ and $z=7$. ( 5 pts each)
a. $3(x+5)-2 y$
b. $5 y^{2}+2 z-x y$
c. $4 y+\frac{2 x-y}{z}$
7) Simplify the following algebraic expressions by combining like terms. (5 pts each)
a. $8+5 x+9-8 x$
b. $-2(3 x+y)-(x-y)$
c. $\frac{3}{49 x} \div \frac{-5}{28 x}$
8) Find the exact volume of a sphere with a radius of 3 inches. Recall $V=\frac{4}{3} \pi r^{3} \cdot(5 \mathrm{pts})$
$\mathrm{V}=$ $\qquad$ $\mathrm{in}^{3}$
9) Solve the following equations. Write rational (fractions) answers in lowest terms. (5 pts each)
a. $-3=6 x$
b. $0=-7 x+28$
c. $\quad x-\frac{2}{3}=\frac{7}{3}$
10) The perimeter of a triangle is 28 centimeters. If two sides have equal length and the length of the third side is 8 centimeters, what is the length of each of the other two sides? ( 5 pts )
11) Mr. Wilbur currently has 4 whippets; Diamond, Amber, Emma, and Fire. All together they eat 9 cups of dog food per day. The girls; Diamond, Amber, and Emma each eat 2 cups per day. How many cups of food does Fire eat per day? ( 5 pts )
12) Find the perimeter and area of a rectangle with a length of 20 meters and a width of 6 meters. $\mathrm{P}=2 \mathrm{~b}+2 \mathrm{~h}$ and $\mathrm{A}=\mathrm{bh} \quad$ ( 5 pts each)
a. $\quad \mathrm{P}=$ $\qquad$ meters
b. $\mathrm{A}=$ $\qquad$ meters ${ }^{2}$
13) Plot the following points on the number line below. ( 5 pts )

$$
\left\{-4.8,-2, \frac{5}{2}, 6 \frac{1}{3}, 9\right\}
$$


14) Simplify the following inequality, then graph it on the number line below. ( 5 pts )

$$
-3 x+3>2 x+13
$$


15) Suppose the discount on a new refrigerator is $\$ 250$. This discount represents a $20 \%$ off sale. ( 5 pts each)
a. What was the original selling price of the refrigerator?
b. What was the sale price?
c. What would a customer pay for the refrigerator if a $4.5 \%$ sales tax was added to the sale price?
16) Plot and label the following points on the graph below. (5 pts)

A ( 0,3 )
B ( $-5,3$ )
C ( $4,-2$ )
D ( $-5,0$ )
E ( $-4,-6$ )

17) Consider the points $A(2,-3)$ and $B(0,-6)$. ( 5 pts )
a. Find the slope of the line passing through the two points.
b. Find the $y$-intercept of the line.
c. Write down the equation of the line in slopeintercept form $(y=m x+b)$.
d. Graph the line.
$\mathrm{m}=$ $\qquad$
$y$-int. $=$ $\qquad$
$\mathrm{y}=$ $\qquad$

18) Find the equation for the line parallel to the line $3 x+2 y=-1$ and passing through the point (3,-2). (5 pts)
19) Find the equation for the line perpendicular to the line $3 x+2 y=-1$ and passing through the point ( $3,-2$ ). ( 5 pts )
20) Graph the inequality $3 x+6>y$ on the graph below. ( 5 pts )

21) Graph the inequality $x \leq y$ on the graph below. (5 pts)

22) Consider the function: $f(x)=2 x^{2}-8 x+8$. Write rational (fractions) answers in lowest terms. (5 pts each)
a. Find the value of $f(3)$
b. Find the value of $f(-2)$
c. Find the value of $f\left(\frac{1}{2}\right)$

1. The distance Mr. Wilbur's whippet Diamond can jump from a standing position is 8 feet. And, Mr. Wilbur has observed that if Diamond is running when she jumps she can jump $1 / 2$ foot further for every mile per hour of she is running. ( 5 pts each)
a. Write a linear equation in the form $\mathrm{y}=\mathrm{mx}+\mathrm{b}$ that represents how far Diamond can jump based on her speed $x$.
b. If Diamond is running 16 mph , what is the widest ditch she can jump across? $y=$ $\qquad$ feet
c. How fast must Diamond be running to jump a 24 -foot wide ditch? $x=$ $\qquad$ mph

