ANSWERS TO THIS, CLICK HERE.

Homework: http://math.mnrt.net/

Name _____Date_____ _____ raw _____ scaled _____ percent

Math 10 (200 Points)

Final Exam

- **This exam will be weighted to count for 20% of your third trimester grade.**
- **Partial credit may be given for correct work. Therefore, it is to your advantage to write clear solutions. If I cannot understand a solution within 90 seconds, then it will receive no partial credit.**
- **Answers must be completely simplified. No denominators may include radicals. All fractions simplified. Arithmetic must be completely performed; e.g. write 9 instead of $\sqrt{81}$ and $2\sqrt{3}$ instead of $\sqrt{12}$.**
- **No calculators. All answers must be exact, unless question states otherwise.**
- **All questions count 10 points. There are 20 questions. You have two hours.**

[1] Completely factor in the real numbers $(p-q)^2 - 4r^2$.

[2] Completely factor in the real numbers $x^4 - 16$.

[3] Completely factor in the real numbers $x^4 - 6x^2 + 9$.

[4] Completely factor in the real numbers $x^2 + x - y^2 - y$.

[5] Find all real and complex roots. $(x^2 - x)^2 - 4(x^2 - x) - 12 = 0$

[6] Find all real and complex roots. $x^2 - 4x + 1 = 0$.

[7] Find all real and complex roots. $2x^2 - 11x + 15 = 0$.

[8] Find the value of p such that $x^3 - 3x^2 - x + p$ is divisible by 3.

[9] Find all cube roots of unity; that is, solve in the complex numbers the equation $x^3 = -1$.

[10] Simplify. $\sqrt{-2}\,\sqrt{-2}$.

[11] State the broadest conditions on a and b under which it must be true that $a > b \Longrightarrow a^2 > b^2$.

[12] Find all real and complex solutions of $1 + 2x - x^2 \geq 0$.

[13] Find all real and complex solutions of $x^2 + 2x + 2 = 0$.

[14] Find all real and complex solutions of $x^3 - 2x^2 - x + 2$.

[15] Find the equation of the line through $P(-2, 3)$, $Q(5, 9)$. Answer in standard form $a\,x + b\,y + c = 0$.

[16] Find the equation of the line through $P(-1, -5)$ and perpendicular to $y = -\frac{1}{3}\,x + 100$. Answer in standard form $a\,x + b\,y + c = 0$

[17] Find the equation of the line(s) through $P(1, 5)$ and tangent to the circle $x^2 + y^2 = 1$.

[18] Find the center and radius of the circle $x^2 + 4\,x + y^2 - 6\,y + 9 = 0$.

[19] Find the maximum value (if it exists) and the minimum value (if it exists) of each of the function $y = x^2 - 5\,x + 6,\ x \le 4$.

[20] Find the quadratic function that passes through $P(3, 7)$ and whose vertex is $V(2, 5)$.