MAT 099-G14 Test 1 Name_____
100 Points Covers Chapter 1 NO GRAPHING CALCULATORS!!!

Do your own work. SHOW your work. When in doubt about how stupid I am, assume the worst.

1. (5 pts) Simplify $2-7(2x+3)-7(2-3x)$

2. Multiply

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

   b. (5 pts) $(7x+4y)^2$

   c. (5 pts) $(2x-3)(3x^2-5x+9)$

3. (5 pts) Evaluate b^2-4ac if $a=5, b=-9,$ and $c=-6$.

4. (5 pts) Factor 33462 into the product (of powers) of primes.

5. (5 pts) Simplify $\sqrt{33462}$

6. (5 pts) Write $\frac{4290}{33462}$ in lowest terms. (You've done part of the work, already.)

7. (5 pts) Find the next term in the sequence.

   a. - 5, 3, 11, …

   b. - 100, 20, - 4, …

8. (5 pts) A store sells radios at a price, *p*. The store owner has found that the number of radios sold, *x*, is related to price by the following equation: $x = 1{,}000 - 2p$. Give the equation for the revenue, *R*, entirely in terms of the price variable.

9. Factor.

   a. (5 pts) $150a^5b^3 - 60a^4b^7$

   b. (5 pts) $x^2 - 3x - 10$

   c. (5 pts) $9x^2 - 16$

10. (5 pts) Solve the equation $3x-7=5x+11$ for x.

11. (5 pts) Add $\frac{7}{30}+\left(-\frac{5}{42}\right)$

12. (5 pts) Convert 70 kilometers (km) per hour into units of miles per hour. (Hint: 2.54 cm $\approx$ 1 in, 5280 feet = 1 mi, 100 cm = 1 m, 1000 m = 1 km). This might take two lines, if you write as big as I do!

13. Simplify. Assume all variables represent nonzero real numbers. Your final answer should contain only positive exponents.

    a. (5 pts) $\left(x^3y^{-7}\right)\left(x^{-5}y^2\right)$

    b. (5 pts) $\left(x^2y^{-3}\right)^{-7}\left(x^{-5}y^5\right)^4$

c. (5 pts) $\dfrac{5^4 x^7 y^{-5}}{75x^2 y^2}$

d. (5 pts) $\dfrac{\left(6^{-1} x^2 y^3\right)^{-2}}{\left(15x^{-2} y^{-5}\right)^4}$

14. (5 pts) Consider the equation $ax^2 + bx + c = 0$. Write the discriminant.

Bonus stuff. You can add up to 15 points to your score. I grade the first 15 points' worth of attempts that I see.

1. Two-parter:
   a. (5 pts) What condition must the discriminant satisfy in order for $ax^2 + bx + c$ to factor by 'ac' method?

   b. (5 pts) What condition must the discriminant satisfy in order for $ax^2 + bx + c$ to be a perfect square trinomial?

2. (5 pts) What's the solution of the equation $ax^2 + bx + c = 0$?

3. (5 pts) Factor $84x^3 - 72x^2 - 245xy + 210y$ into the product of two binomials.

4. (5 pts) Factor $189x^2 - 138x - 80$ into the product of two binomials.

5. (5 pts) Factor $24x^3 - 375y^6$

6. (5 pts) Factor $x^3 + 27$, if possible.

7. (5 pts) Use Pascal's triangle to expand $(x-2y)^5$

8. (5 pts) Factor $x^2+10x+20$ (It doesn't factor over the rationals! Your 'ac' method won't work!).

9. (5 pts) What's $\sqrt{-1}$?

10. (5 pts) Give an example of "Powers distribute over products."

11. (5 pts) Give an example of "Products distribute over sums."