

NAME \_\_\_\_\_

4 February 2009

**MATH 121-003 — TEST I**

*PLEASE READ THESE INSTRUCTIONS:*

If you want credit for an answer, you **must** show your work – a correct answer without accompanying (and correct and readable) explanation will likely receive **zero credit**.

You may use a graphing calculator, but **not** a calculator (such as the TI-89) capable of symbolic manipulation. You may not use your book or notes.

*PLEASE TURN OFF YOUR CELL PHONE.*

- 1 Factor the polynomial  $64x^2 - 3$ .
- 2 Use synthetic division to find the quotient and remainder when  $x^2 + 12x + 28$  is divided by  $x + 7$ .
- 3 Simplify  $\left(\frac{x^9 y^7}{xy^3}\right)^{\frac{1}{4}}$ .
- 4 Solve  $\frac{2}{x^2 - 3x + 2} - \frac{5}{x^2 - 1} = 0$  for  $x$ .
- 5 Solve  $\sqrt[4]{2x + 3} = 2$  for  $x$ .
- 6 Solve  $|2 - 3x| - 2 = 0$  for  $x$ .

**7** Solve the inequality  $-9 \leq \frac{2x+3}{-4} \leq 7$  for  $x$ , writing your answer in interval notation.

**8** Solve the inequality  $|3x+1| > 10$  for  $x$ , writing your answer in interval notation.

**9** What number should be added to  $x^2 - \frac{4}{3}x$  to complete the square?

**10** Solve  $3|x-3| = 18$  for  $x$ .

**11** Solve  $x^2 - 4x + 8 = 0$  for  $x$ , using complex numbers if necessary.

**12** Solve  $2x^3 + 5x^2 - 8x - 20 = 0$  for  $x$ . [*Hint: grouping*]

**13** Lance Armstrong starts off on his bicycle along one of those long straight highways across Kansas at exactly noon. At 2pm, Michael Schumacher takes off from the same spot, following Lance and going 50 *mph* faster. At 3pm, Schumacher is only 10 miles behind Armstrong. How fast was Armstrong going and how far did he get by 3pm?

**14** Solve  $x^4 - 50x^2 + 49 = 0$  for  $x$ .

**15** The length of a rectangular vegetable garden is 9 feet longer than its width. If the area of the garden is 70 square feet, find its dimensions.