Exam II
Math 135: Intermediate Algebra
November 21 2007

Instructions: Please write your name on every page. All 8 problems are worth an equal number of points. As always, show your work. Partial credit will be given for incorrect answers with relevant work shown. Credit will not be given for correct answers with no work shown. Good luck!

Name:	
Signature:	

Do not mark. For grading purposes only.

Question	Score	Possible
1		10
2		10
3		10
4		10
5		10
6		10
7		10
8		10
Total		80

Useful Formulas

$$\text{midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$

$$y - y_1 = m(x - x_1)$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$$m_{\text{perp}} = -\frac{1}{m}$$

$$\text{Distance} = \text{Rate} \times \text{Time}$$

$$\text{Area of rectangle} = \text{Length} \times \text{Width}$$

$$\text{Area of triangle} = \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$\text{Area of circle} = \pi \times \text{Radius}^2$$

$$\text{Surface area of sphere} = 4\pi \times \text{Radius}^2$$

1. Multiply: $(2x^4 - x^3 + 3)(x + 5)$.

2. Divide: $(4x^4 - 1) \div (x - 1)$

3. Factor: $x^2 - 3x - 18$

4. Solve: $10x^2 - 11x + 3 = 0$

5. Solve: $(x + 3)^2 = 5(2x + 1)$

6. A city planner is designing a park which will be 200 meters longer than it is wide. If the park is to be 240,000 square meters in area, what are its length and width?

7. A man standing on the top of a 90 meter high cliff throws a rock straight upward at 15 meters per second. The rock goes up some distance, then falls back to the base of the cliff. Its height *relative to the height from which it was thown* after t seconds is given by $-5t^2 + 15t$ meters. Find:

   (a) How long after the rock is thrown does it pass the man standing on top of the cliff?

   (b) How long after the rock is thrown does it hit the ground at the base of the cliff?

8. If a bank account earns interest at an annual rate r, to figure out how much it is worth after a year you multiply its original value by $(r + 1)$. For example, an account with a starting value of $500 earning interest at a rate of 4% would be worth $500(0.04 + 1) = 500(1.04) = 520$ dollars at the end of a year.

(a) Suppose an account with a starting value of $1,000 were worth $1,050 at the end of a year. Find the interest rate.

(b) Suppose an account with a starting value of $1,000 were worth $1,210 at the end of *two* years. Find the interest rate. (Hint: remember that in the second year, the account earns interest on its value at the end of the first year, not its value at the beginning.)