Math 100
American River College

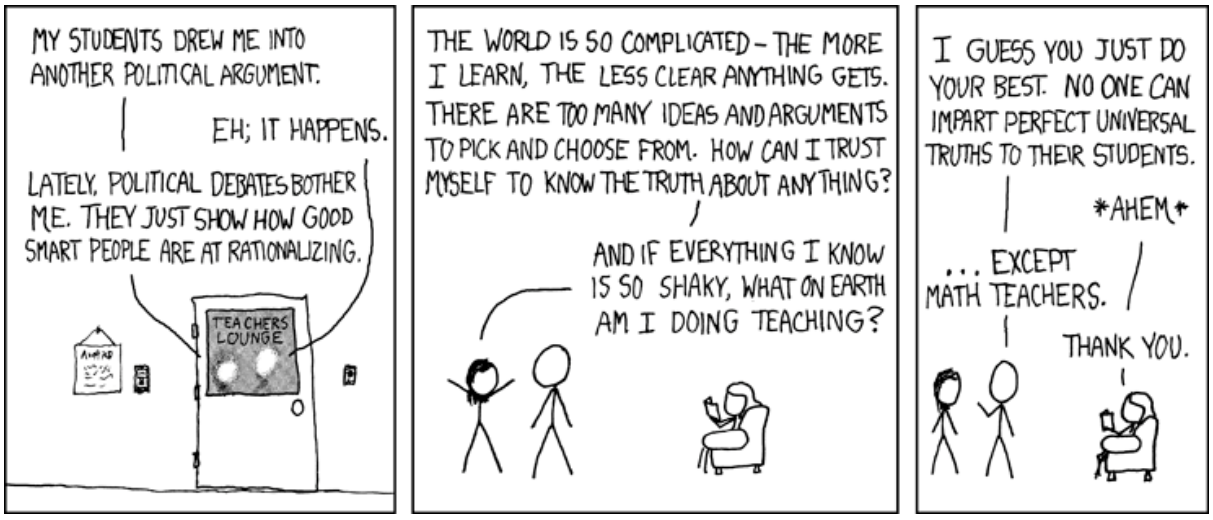
Name: _____

Student ID: _____

Exam 5

PLEASE READ ALL THE DIRECTIONS CAREFULLY

- Show all work. Solutions without proper work will receive no credit.
- Present work in a clear, organized manner.
- No notes, books, or calculators allowed.
- Write answers in **lowest terms** when appropriate
- Good Luck!



Problem	1	2	3	4	5	6	7	Bonus	Total
Score									
Possible	10	10	12	12	20	20	16	10	100

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1. (10 points) Simplify the radical expressions

   a. (3 points) $\sqrt{\frac{75x^8}{81y^{12}}}$

   b. (3 points) $\sqrt[3]{64x^9y^2}$

   c. (4 points) $\frac{12-\sqrt{18}}{21}$

2. (10 points) Solve the variation problems.

   a. y varies directly as x and $y = 4$ when $x = 20$.
      i. State the variation equation.
      ii. Find the constant of variation k
      iii. Find the value of x when $y = 5$.

   b. y varies inversely as x and $y = 8$ when $x = 10$.
      i. State the variation equation.
      ii. Find the constant of variation k
      iii. Find the value of y when $x = 20$.

3. (12 points) Rationalize the denominators.

   a. (5 points) $\dfrac{\sqrt{45y}}{\sqrt{5y}}$

   b. (7 points) $\dfrac{2}{\sqrt{6}-2}$

4. (12 points) Simplify the expressions. Write answers in exponential form and with positive exponents.

   a. (3 points) $4^{\frac{3}{2}}$

   b. (3 points) $\dfrac{2^{2/3}}{2^{-1/3}}$

   c. (6 points) $\left(2x^{1/2}\right)^3 \cdot \left(3x^{1/3}\right)^2$

5. (20 points) Simplify the radical expressions.
   a. (3 points) $\sqrt{a} + 4\sqrt{a} - 2\sqrt{a}$

   b. (5 points) $\sqrt{36x^3} + \sqrt{81x^3}$

   c. (5 points) $\sqrt{3}\left(\sqrt{2} + 2\sqrt{12}\right)$

   d. (7 points) $\left(4\sqrt{3} + \sqrt{2}\right)\left(\sqrt{3} - 2\sqrt{2}\right)$

6. (20 points) Solve each equation for x.

a. (3 points) $(x-5)^2 = 36$

b. (3 points) $(x+2)^2 = -25$

c. (6 points) Solve this equation by using the quadratic equation.

$$2x^2 + 5x - 3 = 0$$

d. (8 points) Solve this equation by using the completing the square.

$$x^2 + 6x - 7 = 0$$

7. (16 points) Solve the radical equations.
   a. (6 points) $\sqrt{6-x}=3$

   b. (10 points) $x+1=\sqrt{x+7}$

Bonus: Solve the equation for x by using any method (factoring, completing the square, or quadratic formula)

$$(x-2)(5x+4)=3x^2-15x-12$$