

DUE Tuesday, November 7, 2006

For your reference:

$$a^n a^m = a^{n+m} \qquad (a^n)^m = a^{nm} \qquad (ab)^n = a^n b^n$$
$$\frac{a^n}{a^m} = a^{n-m} \qquad a^{-n} = \frac{1}{a^n}$$

Directions: Please read all questions carefully. Answer all parts of each question. Please circle or box your final answers. Show all work and justify all answers for full credit. Partial credit is always given for correct methods, partial correct calculations, and correct justification (rules, theorems, definitions, etc). Point values for each question are indicated in parentheses. Good luck.

Unless the problem specifies otherwise, **simplified means:**

- 1) Any exponential or radical expression that can be evaluated to an integer must be written as the integer (i.e. $81^{1/2}$ or $\sqrt{81}$ must be written as 9).
- 2) Any exponential expressions with the same base must be combined when possible.
- 3) The radicand must contain no factor other than one that is a perfect power of the index.
- 5) There must be no fraction under the radical sign.
- 5) No radical can remain in the denominator of a radical expression.
- 6) A complex number must be written in standard form, $(a + bi)$.

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- 1) (3pts) Simplify the following expression. Clearly show each step in your simplification. Write the final simplified answer as 3^n , with the appropriate real number exponent n.

$$\frac{3^3 \cdot (3^{3/2} \cdot \sqrt{3^{-5}})^2}{8^0 \cdot 27^{1/3} \cdot 3^{-2}}$$

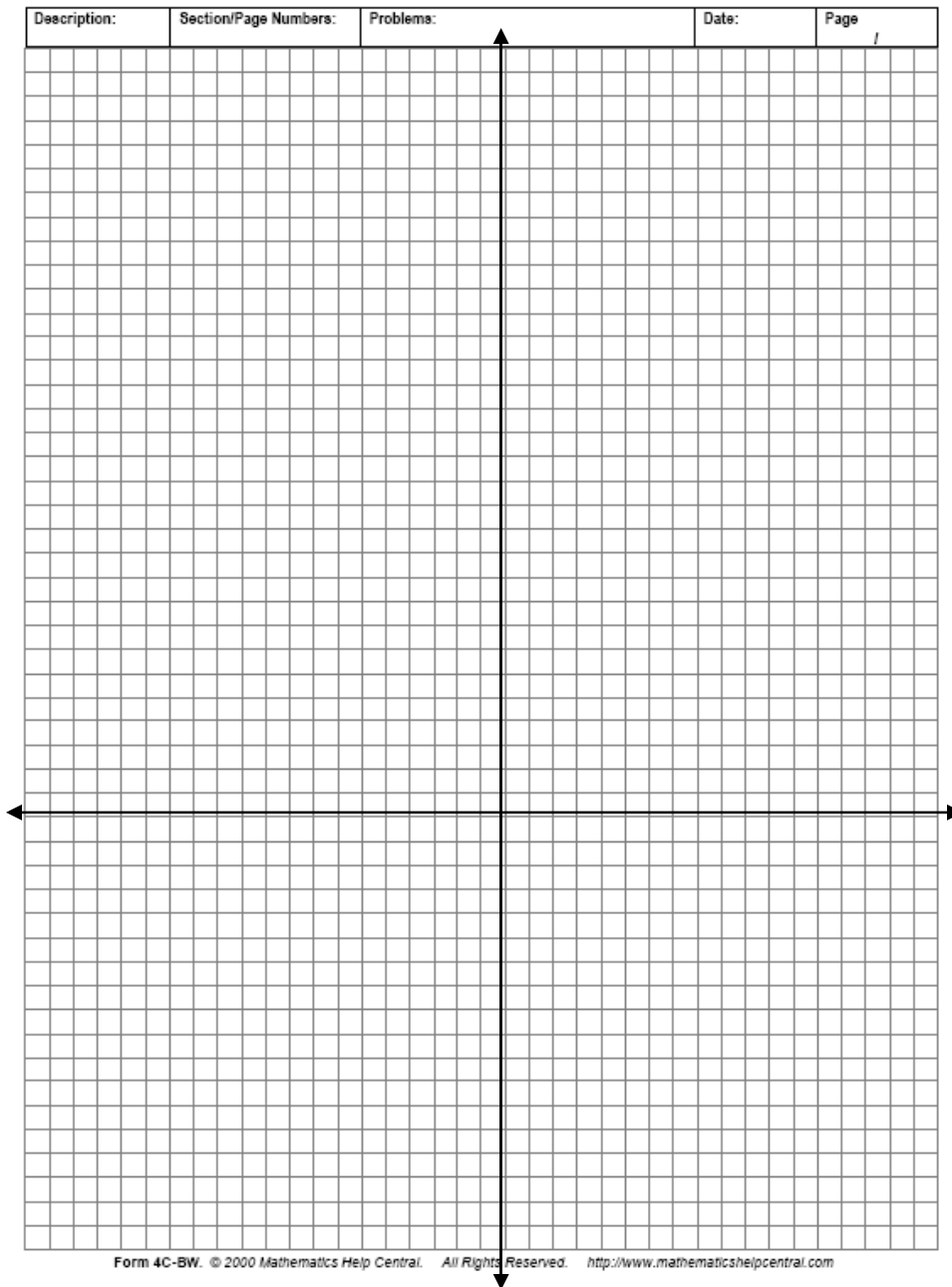
2) (3pts each) Simplify. Recall the rules for simplifying found in the exam instructions.

a.
$$\frac{\sqrt[3]{32x^7y}}{\sqrt[3]{4xy^4}}$$

b.
$$\frac{\sqrt{3} + \sqrt{5}}{\sqrt{3} - \sqrt{5}}$$

c.
$$(-3 + 2i) - [(3 + 8i)(1 + 2i)]$$

- 3) (4pts) State the **domain** of and sketch the **graph** of the following function: $f(x) = \sqrt{-x + 2}$
Plot at least 4 accurate points on the graph.

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- 4) (4pts) Solve the following equation for x. Check for extraneous solutions if necessary.

$$\sqrt{5x+4} - \sqrt{3x+1} = 1$$