Mat 011 Agenda Day 16       June 13, 2006

Return Quiz

Worksheets

Review for Test 3

Homework:  Topic 25
Study for Test 3
\[(3 \sqrt[6]{x^4})^6 = 3^6 x^{24} = 729 x^{24}\]
\[
\frac{16}{x} = \frac{20}{4}
\]

\[
\frac{16}{x} = \frac{20}{4} \Rightarrow 16 \cdot 4 = 20 \cdot x \Rightarrow 64 = 20x \Rightarrow x = \frac{64}{20} \Rightarrow x = 3.2
\]
\[
\frac{4}{28x^3} - \frac{6}{7x} = \frac{4x^{-6}}{x^3} = \frac{4}{x^3 \cdot x^6} = \frac{4}{x^9}
\]
\[
\frac{3x^6}{(4x^3)^{-2}} = 3x^6 \cdot (4x^3)^2 \cdot 1
\]

\[
= 3x^6 \cdot 4^2x^6
\]

\[
= 48x^{12}
\]

\[
\frac{3x^6}{4^{-2}x^{-6}}
\]
\[(7.2 \times 10^2) \times (8.4 \times 10^{-9})\]

\[0.000006048\]

\[6.048 \times 10^{-6}\]
Which is a better buy?

77 oz for $2.10

\[
\frac{2.10}{77} = 0.027 \text{ cost/oz}
\]

\[
\frac{77}{2.10} = 36.62 \text{ oz/\$}
\]

92 oz for $2.70

\[
\frac{2.70}{92} = 0.029 \text{ cost/oz}
\]

\[
\frac{92}{2.70} = 34.07 \text{ oz/\$}
\]
7 pages in 3 minutes

time for 81 pages

\[
\frac{7 \text{ pages}}{3 \text{ time}} = \frac{81 \text{ pages}}{X \text{ time}}
\]

\[
7X = 243
\]

\[
X = 84.71 \text{ minute}
\]

\[
\frac{3 \text{ time}}{7 \text{ pages}} = \frac{X \text{ time}}{81 \text{ pages}}
\]

\[
7X = 243
\]
<table>
<thead>
<tr>
<th>ID</th>
<th>(2000 \times (1.17)^{\text{ID}})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(2000 \times (1.17)^{1})</td>
</tr>
<tr>
<td>2</td>
<td>(2000 \times (1.17)^{2})</td>
</tr>
<tr>
<td>3</td>
<td>(2000 \times (1.17)^{3})</td>
</tr>
<tr>
<td>5</td>
<td>(2000 \times (1.17)^{5})</td>
</tr>
<tr>
<td>10</td>
<td>(2000 \times (1.17)^{10})</td>
</tr>
</tbody>
</table>

\[ N = 30 \times 2000 \times (1.17)^{30} \]

\[ 2000 \times (1.17)^N \leq 222,129 \]

\[ 2340 \]

\[ 2738 \]

\[ 3203 \]

\[ 4384.89 \]

\[ 9614 \]
\[ P = A \left[ \frac{t}{1 - (1 + i)^{-n}} \right] \]

\[ P = \frac{16,500 \times 12}{1 - (1.0075)^{-60}} \]

\[ \frac{0.0075}{12} = 0.0075 \]
1. \[
\frac{12x^2}{3x^6}
\]
3. \((2x^3)^4\)
4. \[
\frac{x^{-5}}{(2x^2)^{-4}}
\]
2. \[ \frac{2x^{-2}}{10x^3} \]
5. Compute the following using a calculator and write in scientific notation:

\[
\left(8.2 \times 10^{11}\right) \left(3.6 \times 10^{-2}\right)
\]
1. \[
\frac{2}{6x^3} \cdot \frac{14y^3}{9x^5} = \frac{4y^2}{3x^2}
\]
2. \[ \frac{4x^2}{x} + \frac{6x}{x^3} = \frac{4x^2}{x} \cdot \frac{x^3}{6x} = \frac{2x^3}{3} \]
3. \( \frac{2x^5}{2x} - \frac{7}{4x^2} \)
4. \[ \frac{2x(x+1)}{3x} + \frac{3(x^2 - 1)}{2x^2} \]

\[ \frac{2x(x+1) + 3(x^2 - 1)}{6x^2} \]

\[ \frac{\sqrt{2}}{2}x + \frac{3x^2}{4} - 3 \]

\[ \frac{5x^2 + 2x - 3}{6x^2} \]
Solve:

\[
\frac{24}{8} - \frac{4}{4} = \frac{5}{12}
\]

\[
15x - 18 = 10
\]

\[
+18 +18
\]

\[
\frac{15x}{15} = 28 \quad \frac{15}{15}
\]

\[
x = 1.9
\]
\[
\begin{align*}
\text{Equation: } \quad & \quad \frac{5x}{8} - \frac{3}{4} = \frac{5}{12} \\
& \quad 15x - 18 = 10 \\
& \quad 15x = 28 \\
& \quad x = \frac{28}{15} \\
& \quad x = 1.86 \\
\text{Expression: } \\
& \quad \frac{5x}{8} - 6.3 - \frac{25}{12} \\
& \quad \frac{15x - 18 - 10}{24} \\
& \quad \frac{15x - 28}{24} \\
& \quad \frac{30 - 28}{24} = \frac{2}{24} = \frac{1}{12}
\end{align*}
\]
\[
6.35 \frac{\frac{5}{3x}}{\frac{35}{7}} = \frac{35}{x}
\]

\[
\frac{7}{3x} - \frac{5}{7} = \frac{35}{x}
\]

\[
7 - 15x = 35x
\]

\[
15x + 15x = 70x
\]

\[
\frac{7}{50} = \frac{50x}{25}
\]

\[
\frac{7}{50} = x
\]

\[
.14 = x
\]
Simplify, write with positive exponents.

\[ \frac{2x^{-3}}{8x^2} = \frac{x^{-5}}{4} \]

\[ \frac{1}{4x^5} \]
8. \[ \frac{25x^{-4}}{(3x^2)^{-3}} \]
9. \((3x^4)^2 = 9x^8\)
10. Compute the following using a calculator: \((6.5 \times 10^{11})(3.2 \times 10^{-3})\)

\[2.08 \times 10^8\]
Which of the following operations require that you find a LCD when you are simplifying algebraic fractions?

<table>
<thead>
<tr>
<th>Operation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>addition</td>
<td>X</td>
</tr>
<tr>
<td>subtraction</td>
<td>X</td>
</tr>
<tr>
<td>multiplication</td>
<td></td>
</tr>
<tr>
<td>division</td>
<td></td>
</tr>
</tbody>
</table>
1. Find the LCD of the two fractions:

\[
\frac{1}{5x} + \frac{1}{35x^6} = \frac{7x^5 + 1}{35x^6}
\]
3. The LCD is $24x^2$. What do you have to multiply the numerator and denominator by to convert the following fraction?

\[
\frac{1}{3x} \cdot \frac{8x}{8x}
\]
4. Describe what is wrong with the following problem.

Reduce: \( \frac{4 + 5}{4} = \frac{1 + 5}{1} \)

\[
\frac{4 + 5}{4} = \frac{9}{4}
\]

\[
\frac{4}{4} + \frac{5}{4} = 1 + \frac{5}{4}
\]

\[
\frac{4}{5} = \frac{x}{2}
\]
4a. Describe what is wrong with the following problem.

\[
\frac{A + 5}{A} = 1 + 5
\]

You cannot cancel terms.

4b. What are you allowed to cancel when reducing fractions?
5. What do you do with the LCD when you are solving an equation?

You multiply each of the terms on both sides of the equation by the LCD to eliminate the denominators in the equation.
Perform the indicated operations.

\[
\frac{7x}{2x^3} \div \frac{2x^2}{5}
\]

\[
\frac{\frac{7x}{2x^3}}{\frac{2x^2}{5}} = \frac{7x}{2x^3} \cdot \frac{5}{2x^2}
\]

\[
= \frac{35}{4x^4}
\]
Perform the indicated operations.

$$\frac{5}{4x} + \frac{7}{12}$$

$$\frac{3(5) + 7x}{12x}$$

$$\frac{15 + 7x}{12x}$$
\[ \frac{x}{4} + \frac{1}{2} = \frac{7}{8} \]

**Solve the equation**
\[
\frac{x}{4} + \frac{1}{2} = \frac{7}{8}
\]

\[
\left(\frac{x}{4}\right) + \left(\frac{1}{2}\right) = \frac{1}{8}
\]

\[
2x + 4 = 7
\]

\[
\frac{2x}{2} = \frac{3}{2}
\]

\[
x = \frac{3}{2} \text{ or } 1.5
\]
\[
3 - \frac{4x + 2}{3} = \frac{x - 1}{6}
\]

Solve the equation
8. Simplify. Write with positive exponents only.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Evaluation</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x^5x^3$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$(3x^4)^2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{4x}{2x^3}$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. Simplify. Write with positive exponents only.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Evaluation</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x^{-5}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$4x^{-3}$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. Simplify. Write with positive exponents only.

\[
\frac{(-2x^2)^4}{3x^{-3}}
\]
9. Use calculator to evaluate:
\((8.6 \times 10^{15})(3.4 \times 10^{11})\)
<table>
<thead>
<tr>
<th>Expression</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-8.4^4 =$</td>
<td></td>
</tr>
<tr>
<td>$(8.4)^4 =$</td>
<td></td>
</tr>
</tbody>
</table>
### 9b. Which one is different?

<table>
<thead>
<tr>
<th>Expression</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5^{-2} =$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{5^2} =$</td>
<td></td>
</tr>
<tr>
<td>$-5^2 =$</td>
<td></td>
</tr>
<tr>
<td>$\left(\frac{1}{5}\right)^2 =$</td>
<td></td>
</tr>
</tbody>
</table>
## 11. Compute

<table>
<thead>
<tr>
<th>Expression</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-3^2 = $</td>
<td></td>
</tr>
<tr>
<td>$( -3 )^2 =</td>
<td></td>
</tr>
<tr>
<td>$-3^{-2} = $</td>
<td></td>
</tr>
<tr>
<td>$( -3 )^{-2} =</td>
<td></td>
</tr>
</tbody>
</table>
12. Write the number in Scientific Notation

A number in Scientific Notation has the form $P \times 10^n$ where $1 \leq P < 10$ and $n$ is an integer.

$36,000,000 = $
13. Write the number in Decimal Notation

A number in Scientific Notation has the form $P \times 10^n$ where $1 < P < 10$ and $n$ is an integer.

$2.4 \times 10^{-3}$
14a. There are 200 bacteria initially present in a culture. The culture grows at a rate of 4% a day. Complete the table.

<table>
<thead>
<tr>
<th>Time</th>
<th>Calculation</th>
<th># of Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Day Later</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Days Later</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Days Later</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n Days Later</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14b. Use the equation to find the number of bacteria there will be in 25 days.

<table>
<thead>
<tr>
<th>Time</th>
<th>Calculation</th>
<th># of Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>n Days Later</td>
<td>$200 \times (1.04)^n$</td>
<td>$200 \times (1.04)^n$</td>
</tr>
<tr>
<td>25 days later</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. Find Ed Rendell’s monthly payments on a 36-month car loan of $10,000 at 6% annual interest.
16. A mathematics professor scales her exam so that 7/8 of the class passes. If 24 students are in the class, how many will pass?
\[
\begin{array}{c|c}
1 - \frac{3x - 1}{3} &= \frac{2 - x}{6} \\
\hline
6(1) - 6 \left( \frac{3x - 1}{3} \right) &= 6 \left( \frac{2 - x}{6} \right) \\
6 - 2(3x - 1) &= 2 - x \\
6 - 6x - 2 &= 2 - x \\
-6x + 2 &= 2 - x \\
4 &= 2 + 5x \\
2 &= 5x \\
\frac{2}{5} &= x
\end{array}
\]