Accelerated math. Homework 27.
Problems marked with * are more difficult.

1. Simplify the following expression:

$$
\frac{\left(x^{2} y^{2}\right) \cdot x^{3}}{x^{2} y^{5}}
$$

2. Let $a=2 \cdot 10^{8,}, b=10^{5}$. Compute
$a^{2} \cdot b$
$\frac{a}{b}$;
$\frac{a^{2}}{b^{2}} ;$
3. If $a=2^{-13} \cdot 3^{9}, b=2^{11} 3^{-7}$ what is the value of $a b$ ? Of $a / b$ ?
4. Evaluate the following expression by the most convenient way:

$$
95^{2}-5^{2}=
$$

5. If, in a right triangle, one leg has length 1 and the hypotenuse has length 2, what is the other leg?
6. 

Let $A B C D$ be a parallelogram, and let $B E, C F$ be perpendiculars from $B, C$ to the line $A D$.
(a) Show that triangles $\triangle A B E$ and $\triangle D C F$ are congruent.
(b) Show that the area of parallelogram is equal to height $\times$ base, i.e. $B E \times A D$.

7.

In the figure to the right, $A B C D$ is a rectangle, and $M$ is the midpoint of $B C$. Prove that then triangle $A M D$ is isosceles.

8.

Let
$A=$ set of all people who know French
$B=$ set of all people who know German
$C=$ set of all people who know Russian
Describe in words the following sets:
(a) $A \cap B$
(b) $A \cup(B \cap C)$
(c) $(A \cap B) \cup(A \cap C)$

