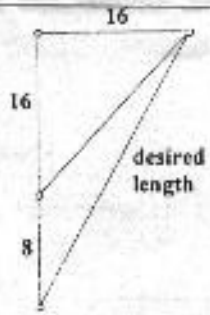
25. 2001 = (3)(23)(29) and 2002 =(2)(7)(11)(13), so sp(2001) = 55 and sp(2002) = 33, and the difference is 22.

26. IL = 12 and is the altitude to the hypotenuse of right triangle CIM. Let CI = x and LM = 4x. So $(4x)(x) = 12^2$ and thus x = 6 and CM = 30. The area is half the product of the diagonals, area = $\frac{(24)(30)}{2} = 360$

27. The third to last factor is $(x - x) = 0$, so the product is 0.

28. One method is to use Law of Cosines. Another way is to extend the 8 as shown by 16 each way. So the length desired is the hypotenuse of a right triangle with legs 16 and 24, or $8\sqrt{13}$



29. The line has slope 3/2 and equation $\log_8 y - 6 = \frac{3}{2}(x-2)$, which becomes $\log_8 y = \frac{3}{2}x + 3$, so $y = 8^{1.5x+3} = 2^{3(1.5x-3)} = 2^{4.5x-9} = 2^9 \cdot 2^{4.5x}$

30. $3^4 = 81 = 1 + 80$. So $3^{2000} = \left(3^4\right)^{500} = (1+80)^{500}$. Now apply the Binomial Theorem to get $1^{500} + 500 \cdot 1^{499} \cdot 80 + \frac{500 \cdot 499}{2} \cdot 1^{498} \cdot 80^2 + stuff \cdot 80^3 + \cdots$, with every term after that having a higher power of 80,

So the last three digits are 1 + 000 − 000 + 000 − 000, etc. or 001. Finally to get one extra factor (exponent 2001) multiply by 3 to get 003