Name: Date:

1. $\boxed{1{,}111{,}098}$

2. $\boxed{-1}$

3. $\boxed{\frac{203}{30}}$

4. $(1-\frac{1}{2010})(1-\frac{1}{2009})(1-\frac{1}{2008})(1-\frac{1}{2007})\ldots(1-\frac{1}{1002})(1-\frac{1}{1001})(1-\frac{1}{1000})$
$=(\frac{2010}{2010}-\frac{1}{2010})(\frac{2009}{2009}-\frac{1}{2009})(\frac{2008}{2008}-\frac{1}{2008})\ldots(\frac{1002}{1002}-\frac{1}{1002})(\frac{1001}{1001}-\frac{1}{1001})(\frac{1000}{1000}-\frac{1}{1000})$
$=(\frac{2009}{2010})(\frac{2008}{2009})(\frac{2007}{2008})(\frac{2006}{2007})\ldots(\frac{1001}{1002})(\frac{1000}{1001})(\frac{999}{1000})$
Now cancel, and we end up with $\boxed{\frac{999}{2010}}$

5. $\boxed{2}$

6. $\boxed{0}$

7. $\boxed{\frac{31}{32}}$

8. Memorize this: the sum of the first n counting numbers is $S=\dfrac{n(n+1)}{2}$. For instance, if you want the sum of the numbers $1,2,3,\ldots,10$, we do $S=\dfrac{10(11)}{2}=5\times 11=55$. Use this formula to find the sum of the first 2009 counting numbers: $S=\dfrac{2009(2010)}{2}=2009\times 1005=$ $\boxed{2019045}$

9. $\boxed{\frac{2}{9}}$

10. $3^{2010}-5\times 3^{2009}+6\times 3^{2008}=3^2\times 3^{2008}-5\times 3\times 3^{2008}+6\times 3^{2008}$ (remember your exponent rules?). Now factor: $3^{2008}\cdot(3^2-5\times 3+6)=3^{2008}\cdot(9-15+6)=3^{2008}\cdot(0)=\boxed{0}$