NAME:_____

1. Determine if the statement is sometimes, always, or never true.

    $\ln M = \dfrac{\log M}{\log e}$ (Assume $M > 0$.)

2. Determine if the statement is sometimes, always, or never true.

    $\left(\dfrac{1}{4}\right)^x < \left(\dfrac{1}{5}\right)^x$

3. Determine if the statement is sometimes, always, or never true.

    $\log_a M^r = \dfrac{\log_a M}{r}$

    (Assume $M > 0$, $a > 0$, and $a \neq 1$.)

4. Determine if the statement is sometimes, always, or never true.

    $\log x - \log y = \dfrac{\log x}{\log y}$

    (Assume $x > 0$ and $y > 0$.)

5. Determine if the statement is sometimes, always, or never true.

    $\log_a M^r = r \log_a M$

    (Assume $M > 0$, $a > 0$, and $a \neq 1$.)

6. Determine if the statement is sometimes, always, or never true.

    $y = \log_a x$ if and only if $y = a^x$

    (Assume $x > 0$, $a > 0$, and $a \neq 1$.)

7. Determine if the statement is sometimes, always, or never true.

    $a^x = \left(\dfrac{1}{a}\right)^{-x}$ (Assume $a > 0$.)

8. Determine if the statement is sometimes, always, or never true.

    $a^x = -a^x$ (Assume $a > 0$.)

9. Determine if the statement is sometimes, always, or never true.

    $3^x > 2^x$

10. Determine if the statement is sometimes, always, or never true.

    $\log x - \log y = \log\left(\dfrac{x}{y}\right)$

    (Assume $x > 0$ and $y > 0$.)

11. Determine if the statement is sometimes, always, or never true.

    $\ln M = \dfrac{\log e}{\log M}$ (Assume $M > 0$.)

[1]   always true

[2]   sometimes true

[3]   sometimes true

[4]   sometimes true

[5]   always true

[6]   never true

[7]   always true

[8]   never true

[9]   sometimes true

[10] always true

[11] sometimes true