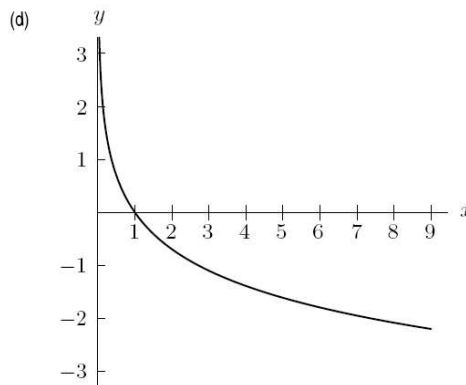
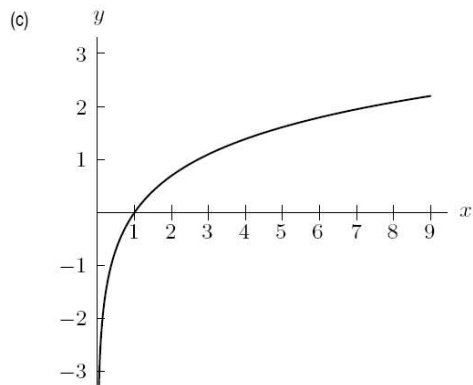
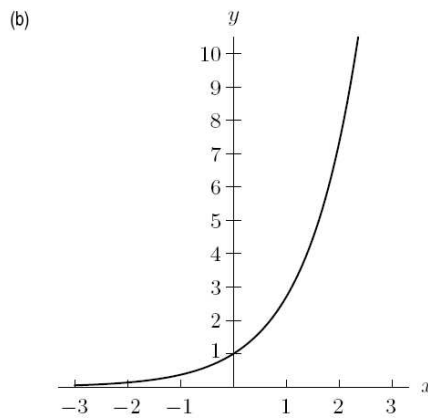
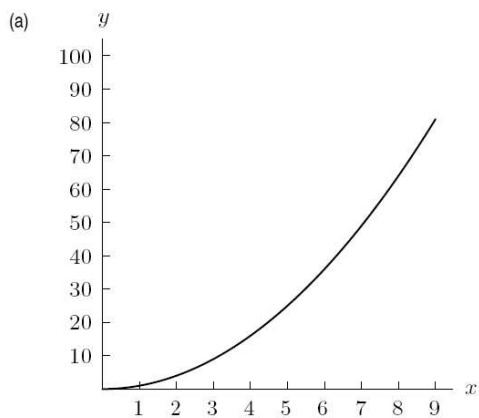


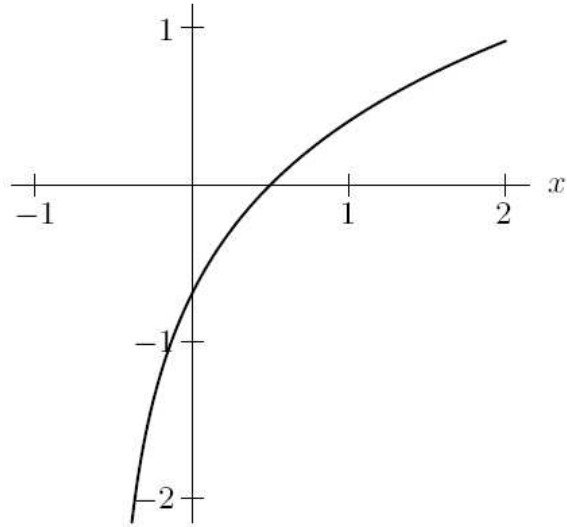
# Classroom Voting Questions: Precalculus

## 1.4 Logarithmic Functions

1. Which is a graph of  $y = \ln x$ ?



2. The graph below could be that of



- (a)  $y = \ln x + \frac{1}{2}$
- (b)  $y = \ln x - \frac{1}{2}$
- (c)  $y = \ln \left(x + \frac{1}{2}\right)$
- (d)  $y = \ln \left(x - \frac{1}{2}\right)$

3. Which of the following functions have vertical asymptotes of  $x = 3$ ?

- (a)  $y = \ln(x/3)$
- (b)  $y = \ln(x - 3)$
- (c)  $y = \ln(x + 3)$
- (d)  $y = 3 \ln x$

4.  $\log \left(\frac{M-N}{M+N}\right) =$

- (a)  $2 \log M$
- (b)  $2 \log N$
- (c)  $-2 \log N$
- (d)  $\log(M - N) - \log(M + N)$

5. If  $\log_{10}(x - a) = n$ , then  $x =$

- (a)  $10^{a+n}$
- (b)  $a + 10^n$
- (c)  $n + 10^a$

(d)  $n + a^{10}$

6. What is the inverse of the following function:

$$P = f(t) = 16 \ln(14t)$$

(a)  $f^{-1}(P) = \frac{1}{14}e^{16P}$

(b)  $f^{-1}(P) = \frac{1}{14}e^{P/16}$

(c)  $f^{-1}(P) = \frac{1}{14} \ln(P/16)$

(d)  $f^{-1}(P) = \frac{\ln 16}{14}P$

7. Solve for  $x$  if  $8y = 3e^x$ .

(a)  $x = \ln 8 + \ln 3 + \ln y$

(b)  $x = \ln 3 - \ln 8 + \ln y$

(c)  $x = \ln 8 + \ln y - \ln 3$

(d)  $x = \ln 3 - \ln 8 - \ln y$

8. Solve for  $x$  if  $y = e + 2^x$

(a)  $x = \frac{\ln y - 1}{\ln 2}$

(b)  $x = \frac{\ln(y-1)}{\ln 2}$

(c)  $x = \frac{\ln y}{\ln 2} - 1$

(d)  $x = \frac{\ln(y-e)}{\ln 2}$

9.  $\log\left(\frac{a^4 b^7}{c^5}\right) =$

(a)  $\log(a^4) + \log(b^7) + \log(c^5)$

(b)  $4 \log a + 7 \log b - 5 \log c$

(c)  $28 \log ab - 5 \log c$

(d)  $\frac{28}{5} (\log a + \log b - \log c)$

(e) None of the above

10. 25 rabbits are introduced to an island, where they quickly reproduce and the rabbit population grows according to an exponential model  $P(t) = P_0 e^{kt}$  so that the population doubles every four months. If  $t$  is in months, what is the value of the continuous growth rate  $k$ ?

(a)  $k = \frac{1}{2} \ln 4$

(b)  $k = \frac{1}{4} \ln 2$

(c)  $k = \frac{1}{50} \ln \frac{4}{25}$

(d)  $k = \frac{4}{25} \ln \frac{1}{50}$

(e) None of the above