## 3 September 2014 Review of Exponentials

(1) Use the laws of exponents to rewrite and simplify the expression.
(a) $9^{\frac{3}{2}}$
(b) $\frac{\left(x^{n} \cdot x^{2 n-5}\right)^{2}}{x^{4 n+1} \cdot x^{-3}}$
(c) $x \sqrt{1+\frac{1}{x^{2}}}, \quad x>0$
(2) Make a rough sketch of the graph of each function.
(a) $y=2^{x+2}$
(b) $y=1-2^{-x}$
(c) $y=2^{|x|}$
(3) Find the domain of each function.
(a) $f(x)=\frac{1-3^{x^{2}}}{1-5^{1-x^{2}}}$
(b) $f(x)=\frac{1+x}{2^{\cos x}}$
(4) A bacterial culture is known to triple every two hours. Suppose there are initially 80 bacteria.
(a) How many bacteria are there after 8 hours?
(b) How many bacteria are there after $t$ hours?
(5) Prove that the function

$$
f(x)=\frac{1-e^{1 / x}}{1+e^{1 / x}}
$$

is an odd function.

