Answers to Problems-Day 3- Classifications and Graphing of Functions, Inverses

1. a) $x \geq 4$ or $x \leq -4,\ y \geq 0, even, not 1-1,$ inverse not a function,
   inverse equation: $y = \sqrt{x^2+16}$ where $x \geq 0$ *important to state

   b) inverse is a function, 1-1, odd, $x \in \mathbb{R}, y \in \mathbb{R}, h^{-1}(x) = x^3$

   c) not even or odd, 1-1, domain $x \in \mathbb{R} : -1 \leq x \leq 1$,
   range $y \in \mathbb{R} : -\frac{\pi}{2} \leq y \leq \frac{3\pi}{2}$,
   $g^{-1}(x) = \sin\left(\frac{x-\frac{\pi}{2}}{2}\right)$ where $-\frac{\pi}{2} \leq x \leq \frac{3\pi}{2}$ * from range of original
2. f(1)=2, f'(1)=3, g'(2)=1/3, $x = \frac{1}{e^2}$
3. g'(3) = 3
4. (1,1), (-1,-1)
5. h'(3) =90
6. 21/32
7. a) f,g even and $f(x) = -\frac{1}{15}x^2(x-4)(x+4)$ and $g(x) = 4\sin^2\left(\frac{\pi x}{2}\right)$, b) h(1)=0,
   c)h'(1)=0, d) <0 e) 19
8. x