MTH 495/595 In-class practice answers. (Send me an email if you think one is incorrect.)

1. B
2. A
3. B
4. $x \in R, x \neq 4$ (the $x \in R,$ part means "x is in R" or "x is a real number")
5. $y \in R, y \neq 0$
6. $-1 < x < 1$
7. $y \geq 1$
8. $x \geq 3$
9. $y \geq 0$
10. Secant line
11. Average speed between A and B
12. The instantaneous speed at B
13. The person is stopped.
14. $f'(x) = \lim_{h \to 0} \left(\frac{f(x+h) - f(x)}{h} \right)$
15. $f'(x) = \lim_{h \to 0} \left(\frac{(x+h)^2 + 4 - (x^2 + 4)}{h} \right) = \lim_{h \to 0} \left(\frac{x^2 + 2xh + h^2 + 4 - x^2 - 4)}{h} \right) =$ $\lim_{h \to 0} \left(\frac{h(2x+h)}{h} \right) = \lim_{h \to 0} (2x + h) = 2x$
16. $f'(x) = 20x^3 - 6x^2$
17. $f'(x) = 0$
18. $f'(x) = \frac{-6}{x^4}$
19. $f'(x) = \frac{2}{\sqrt{x}}$
20. All x
21. It's a little hard to see on the graph but approximately +/-π
22. It's a little hard to see on the graph , but x=0 and a little to the right of -/+ π
23. $f'(x)$ will have a local max or local min
24. 288 feet
25. -176 ft/sec
26. F
27. $f'(-4) \leq f'(1) \leq f'(2) \leq f'(0) \leq f'(-3) \leq f'(-2) \leq f'(4)$
28. Answers may vary – look at your graph and make sure it satisfies the criteria
29. $x_1 < x < x_3$
30. x_1