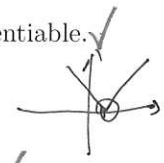
HL1 Quiz #7 — 10/10 Excellent! — Name: Jerry Jiang

Mark each of the first nine statements as true or false. In question ten draw the required graph.

T 1. If events A and B are mutually exclusive then $P(A \mid B) = 0$. ✓

F 2. The function $f: \mathbb{R} \to \mathbb{R}$ with rule $f(x) = |x - 1|$ is everywhere differentiable. ✓



T 3. $\lim_{k \to 0} \dfrac{(a+k)^2 - a^2}{k} = 2a$. ✓

T 4. The tangent to $y = x^2 + x$ at $x = 1$ has equation $y - 2 = 3(x - 1)$. ✓

F 5. The function $f(x) = x^3 + x$ has a stationary point and is therefore not injective. ✓

F 6. The normal to $y = \sqrt{x}$ at $x = 9$ has equation $y - 3 = \frac{1}{6}(x - 9)$. ✓

F 7. The function $f(x) = 4\cos(3(x+2)) + 1$ has range $[1, 5]$. ✓ $[-3, 5]$.

T 8. If $P(A) = 0.6$, $P(B) = 0.5$ and $P(B \mid A) = 0.4$, then $P(A \mid B) = 0.48$. ✓ $P(A|B) = P(B|A) \cdot \dfrac{P(A)}{P(B)} = 0.4 \cdot \dfrac{0.6}{0.5} = 0.48$

T 9. $(f \cdot g \cdot h)'(x) = f'(x) \cdot g(x) \cdot h(x) + f(x) \cdot g'(x) \cdot h(x) + f(x) \cdot g(x) \cdot h'(x)$ ✓

10. Draw the graph of $f(x) = \left| \dfrac{x}{1+x} \right|$ in the window below. Be sure to indicate any key features. ✓