Unit 3 Derivatives Review

1. Evaluate.
2. $\lim\_{h\to 0}\frac{\sqrt[4]{16+h}-2}{h}$ b. $\lim\_{x\to ^{π}/\_{4}}\frac{\tan(x-1)}{x-^{π}/\_{4}}$
3. True or false.
4. A function can be continuous at x = 3, but not differentiable at x = 3.
5. A function can be differentiable at x = 3, but not continuous at x = 3.
6. $f\left(x\right)$ is continuous at x = 0
7. $f\left(x\right)$ is differentiable at x = 0
8. $f\left(x\right)$ is continuous at x = 2
9. $f\left(x\right)$ is differentiable at x = 2 *f*(x)
10. $f\left(x\right)$ is continuous at x = 3
11. $f\left(x\right)$ is differentiable at x = 3 1 2 3 4
12. $f\left(x\right)$ is continuous at x = 4
13. $f\left(x\right)$ is differentiable at x = 4
14. Use the table to answer the following.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | $$f\left(x\right)$$ | $$g\left(x\right)$$ | $$f'\left(x\right)$$ | $$g'\left(x\right)$$ |
| 3 | 4 | 2 | -6 | 5 |
| 4 | 1 | 8 | -3 | 7 |

1. Find $\frac{d}{dx}\left[g\left(f\left(x\right)\right)\right]$ when x = 3. b. Find $h'\left(4\right)$, when $h\left(x\right)=\sqrt{x}∙g\left(x\right)$
2. A particle moves along the curve $s\left(x\right)=t^{3}-9t^{2}+27t$ where *s* is measured in meters and *t* in seconds.
3. Find the acceleration at *t* = 1 second. B. When is the particle at rest?
4. Determine the values of *a* and *b* such that *f*(x) is differentiable.

$$f\left(x\right)=\left\{\begin{array}{c}x^{3}+b, x<3\\ax^{2}, x\geq 3\end{array}\right.$$