

7. G · Differentiation

Starter Quiz ·

AQA · A-Level · Mathematics

Name: _____ Score: _____

1. For $y=x^3-3x$, find dy/dx at $x=2$.

2. Find the derivative of $(3x+1)^4$ at $x=0$.

3. Find the derivative of $\sin x$ at $x=0$.

4. For the worked f, find $f'(4)$.

5. For $p=2e^{(3x)}$, find $p'(0)$.

6. The chain rule multiplies by the inner derivative.

☐ True ☐ False
7. Differentiate the formula with respect to time first, then substitute the measured radius.

☐ True ☐ False
8. Differentiating y^2 with respect to x gives $2y$ without a dy/dx factor.

☐ True ☐ False
9. The normal to a horizontal tangent is vertical, so its gradient is undefined.

☐ True ☐ False
10. A statement that the rate is proportional to the current amount means the same absolute change at all times.

☐ True ☐ False

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Answers ·

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1. **9.0**

 $dy/dx=3x^2-3$. At $x=2$ it is $12-3=9$.
2. **12.0**

Chain rule gives $4(3x+1)^3 \times 3$; at zero this is 12.
3. **1.0**

The sine proof gives $\cos 0=1$.
4. **0.9375**

 $(3/2)/2+4/16-(1/2)/8=15/16$.
5. **6.0**

Retain the coefficient 2 and inner rate 3: $6e^0=6$.
6. **True**

True. The chain rule multiplies by the inner derivative: the derivative of $e^{(x^2)}$ is $2x \cdot e^{(x^2)}$.
7. **True**

True. Differentiate the formula with respect to time first, then substitute the measured radius; substituting first turns the radius into a constant.
8. **False**

By the chain rule, the derivative of y^2 with respect to x is $2y \cdot dy/dx$.
9. **True**

True. The normal to a horizontal tangent is vertical, so its gradient is undefined.
10. **False**

Proportional to the current amount means $dN/dt=kN$, so the change is larger when N is larger.