

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

AQA · A-Level · Mathematics

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 $e^{\hat{}}(x^2)$ is $2x \cdot e^{\hat{}}(x^2)$.

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.