

1. Two objects start at the same point at the same time. Object A is moving due east at a rate of 5 meters per second. Object B is moving due north at a rate $r(t) = 2t$ meters per second, where t is measured in seconds. At what rate is the distance between the objects changing when $t = 10$ seconds?

2. $\int \tan(2x) dx =$

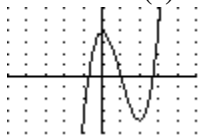
3. A rocket launches vertically from point A on the ground at a vertical rate of 20 feet per second. Point G is on the ground 300 feet from the launch site. With G as the vertex, find the rate at which the angle between the ground and the rocket is changing when $t = 20$ seconds.

4. $\int 3x \sin(4x^2 - 9) dx =$

5. $\int \frac{5x}{2x^2 - 7} dx =$

6. Find the equation of the line tangent to $f(x) = \sin x$ at $x = \frac{\pi}{3}$.

7. The graph below is that of $f'(x)$, where the x and y axes are marked at 1 unit intervals. Find the x -coordinate(s) of the point(s) of inflection.



8. An object is moving along a straight line with velocity $v(t) = 3t^2 - 2t$. At $t = 3$, the position is 4 units east of point P. Consider east as positive and west as negative. Find the location of the object at $t = 9$.

9. $f(x) = \frac{4x^2 + 2x}{\tan(x)}$. Find $f'(x)$.

10. $\int \sin^5 x \cos x dx =$