Name_____ No calculators. Present neatly. Score_____.

1)

Let $r(x) = f(g(h(x)))$, where $h(1) = 2, g(2) = 3, h'(1) = 4,$
$g'(2) = 5,$ and $f'(3) = 6.$ Find $r'(1).$

2)

If $F(x) = f(xf(xf(x)))$, where $f(1) = 2, f(2) = 3, f'(1) = 4,$
$f'(2) = 5,$ and $f'(3) = 6,$ find $F'(1).$

3)

If $xy + y^3 = 1$, find the value of y'' at the point where $x = 0.$

4)

Find the points on the curve $y = (\cos x)/(2 + \sin x)$ at which
the tangent is horizontal.

Your work:

Name_____ **No calculators. Present neatly. Score**_____.

1)

If g is a twice differentiable function and $f(x) = xg(x^2)$, find f'' in terms of g, g', and g''.

2)

If $F(x) = f(3f(4f(x)))$, where $f(0) = 0$ and $f'(0) = 2$, find $F'(0)$.

3)

If $x^2 + xy + y^3 = 1$, find the value of y''' at the point where $x = 1$.

4)

For what values of x does the graph of $f(x) = x + 2\sin x$ have a horizontal tangent?

Your work: