**Differentiate the following:**

1. *f*(*x*) = *x*2cos(*x*)
2. *y* = 8*t*3*e*t
3. *y* = sin(*x*)cos(*x*)
4. *g*(*x*) = 3*x*2ln(*x*) – 5*x*4 + 10
5. *h*(*u*) = *ueu* – *eu*
6. *k*(*x*) = sin(*x*) + *x*4 – *x*2sin(*x*)
7. *y* = 8ln(*x*)sin(*x*) + cos(*x*)
8. *h*(*t*) = *t*sin(*t*) – *t*cos(*t*)
9. *y* = 5*x*3 – *x*ln(*x*)
10. *f*(*x*) = sin2(*x*) = sin(*x*) · sin(*x*)
11. *y* = *xe*xsin(*x*)
12. *g*(*x*) = 3*x*4ln(*x*)cos(*x*)
13. What is the slope of the tangent line to f(*x*) = *x*2*ex* + *x* + 2 at (0,2)?
14. Find the equation of the tangent line to *y* = *x*sin(*x*) at *x* = π.