①   Oct. 23.

- Quiz #3 Solutions posted later today.
- HW6# Due Monday.
- Midterm! Nov. 2.
  (will entertain midterm
                questions Monday.
- Extra Office Hours
   — details Monday.
- Practice Problems (text book has
                                        answers)

Another way to think about chain
rule :
            Consider $f(x) = (x^2 + 3)^4$.
            Find $\dfrac{df}{dx}$.

Alternatively,   let $u = x^2 + 3$.

Then $f(u) = u^4$.

The   chain   rule   says :

$$\frac{df}{dx} = \frac{df}{du} \cdot \frac{du}{dx}.$$

$$f'(x) = f'(u) \cdot u'(x).$$

(2)

$$\frac{df}{du} = 4u^3.$$

$$u = x^2 + 3.$$

$$\frac{du}{dx} = 2x$$

So, $\quad \dfrac{df}{dx} = \dfrac{df}{du} \cdot \dfrac{du}{dx} = 4u^3 \cdot 2x.$

$$= 4(x^2 + 3)^3 \cdot 2x.$$

This method is also useful in our find Differential Calculus topic which is **Related Rates**.