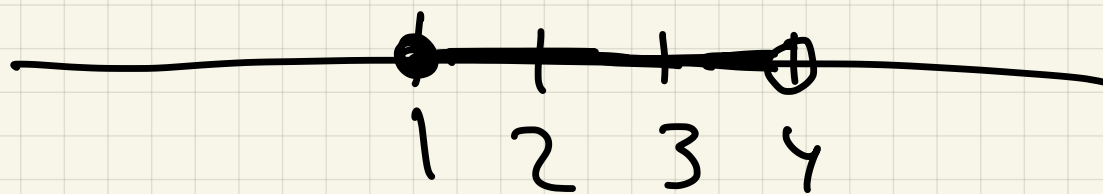


8/31/Preced Quiz

#1

$$x: 1 \leq x < 4$$



$[1, 4)$ ← right one
 $(1, 4]$

#2

$$\left(\frac{1}{3}\right) - \left(\frac{2}{5}\right) = \left|\frac{5}{15} - \frac{6}{15}\right| =$$

$$\left|-\frac{1}{15}\right| = \frac{1}{15}$$

#3

$$\left(\frac{3x^2}{4^3}\right) \left(\frac{2x^2}{x}\right)^{(3)} =$$

$$\left(\frac{3x^2}{4^3}\right) \left(\frac{8x^6}{x^3}\right) = \frac{(2x^2)^3}{x^3 4^3} = \frac{24x^8}{x^3 4^3} =$$

$$\frac{24x^5}{y^3}$$

#4

$$\frac{8(3+\sqrt{13})}{(3-\sqrt{13})(3+\sqrt{13})} =$$

$$\frac{8(3+\sqrt{13})}{9-13} = \frac{8(3+\sqrt{13})}{-4}$$

$$-2(3+\sqrt{13})$$

Last time

polynomial

$$p(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_0$$

$\uparrow$ leading term $\uparrow$ constant

$$n = \deg p(x)$$

$$a_n \neq 0$$

Operations add / subtracting /
multiply

Full method works
after for Calc
General multiplication

Special case:

$$(u-v)(u+v) = u^2 - v^2$$

Ex1 $(x-2)(x+2)(x^2+4)$

(a) FULL on right

$$(x+2)(x^2+4) = x^3 + 4x + 2x^2 + 8$$

$$x^3 + 2x^2 + 4x + 8$$

to finish:

$$(\underline{x-2})(\underline{x^3+2x^2+4x+8}) =$$

$$\begin{array}{r} -2x^3 - 4x^2 - 8x - 16 \\ x^4 + 2x^3 + 4x^2 + 8x \\ \hline \end{array}$$

$$x^4 - 16$$

(h) $\underbrace{(x-2)(x+2)}_{\text{d.f.f of squares}} (x^2+4)$

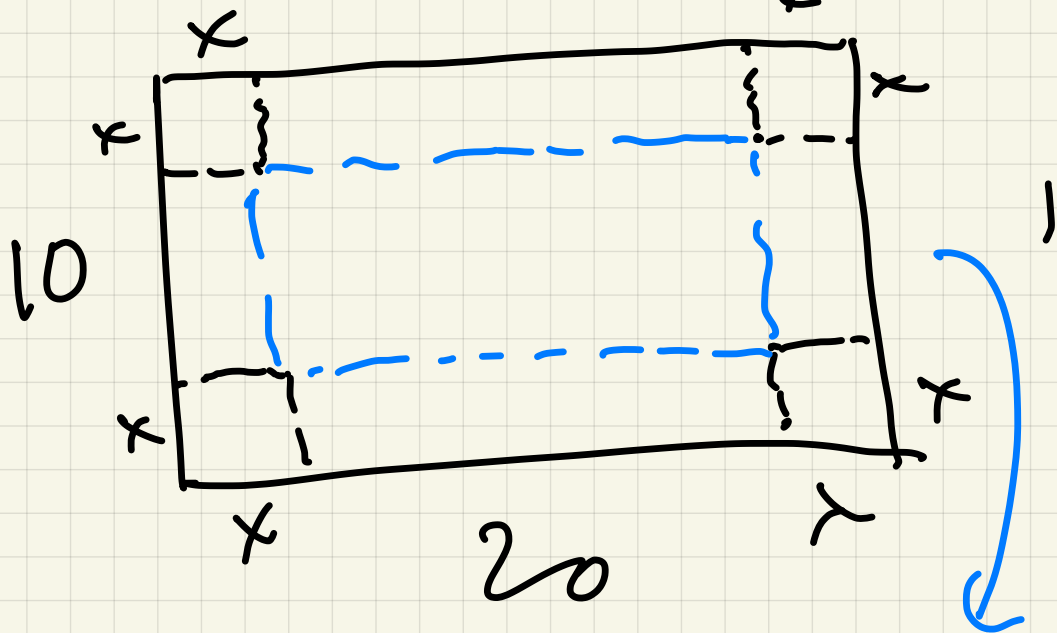
$\underbrace{(x^2-4)(x^2+4)}_{\text{d.f.f squares}}$

$$(x^2)^2 - 4^2 = x^4 - 16 \checkmark$$

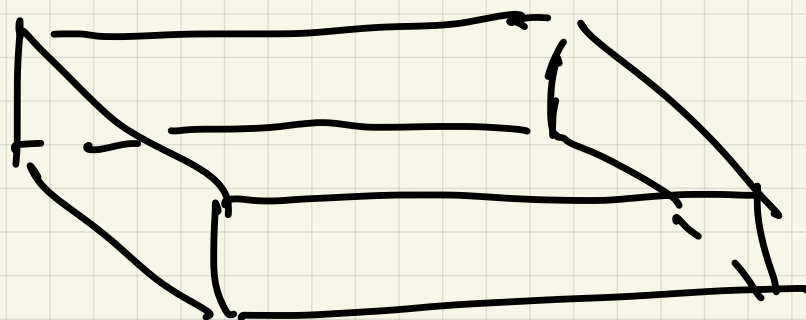
Ex 2 : (Calc problem)

Cut out corners of

10 in $\times$ 20 in rectangle
 and fold into a box:
 what's the volume



$$x < 5$$



box

width $20 - 2x$

ht x

depth $10 - 2x$

$$V = \text{width} \times \text{ht} \times \text{depth} =$$

$$\underbrace{(20-2x)(10-2x)(x)}_{\text{FOL}}$$

$$\underline{(200 - 40x - 20x + 4x^2)(x)}$$

$$(4x^2 - 60x + 200)(x)$$

$$p(x) = 4x^3 - 60x^2 + 200x \leftarrow$$

P4 Factoring

Goal: write a polynomial $p(x)$
as simple product of
lower degree factors
with integer coefficients

$$x^2 - 5 = (x - \sqrt{5})(x + \sqrt{5})$$

↑

Doesn't count for
section P4, but
will be important
later

Ex1 (a) $x^2 = x \cdot x$

(b) $x^4 = x \cdot x \cdot x \cdot x$

Ex2 Some times can
spot a factor:

(a) $x^2 + 5x = x(x + 5)$

(b) $2x^2 + 50x = x(2x + 50)$

(c) $= -5x^2 + 15x - 20$

$= -5(x^2 - 3x + 4)$

can't factor further

explain later

$$(d) \quad (x-5)(\underline{\underline{2x+3}}) + (x-5)(\underline{\underline{3}})$$

$$(x-5)[2x+3]$$

$$(x-5)(2x+3) \checkmark$$