TUES 4-8-08

$5!$ "FIVE FACTORIAL"

$5!$ MEANS $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$

$n! = n \cdot (n-1) \cdot (n-2) \cdots 3 \cdot 2 \cdot 1$

DEFN:

$$0! = 1$$
$$1! = 1$$
$$n! = n \cdot (n-1)!$$

$2! = 2 \cdot 1!$

$3! = 3 \cdot 2!$

⋮

Ex) SIMPLIFY:

$$\frac{8!}{4!} = \frac{8 \cdot 7 \cdot 6 \cdot 5 \cdot \cancel{4 \cdot 3 \cdot 2 \cdot 1}^{1}}{\cancel{4 \cdot 3 \cdot 2 \cdot 1}_{1}}$$

$$= 1680$$

EVIL

$$\frac{8!}{4!} = 2!$$

$$= 2$$

2nd

$$\frac{8!}{4!} = \frac{8 \cdot 7 \cdot 6 \cdot 5 \cdot \cancel{4!}}{\cancel{4!}_{1}}$$

Ex) SIMPLIFY:

$$\frac{12!}{9!3!}$$

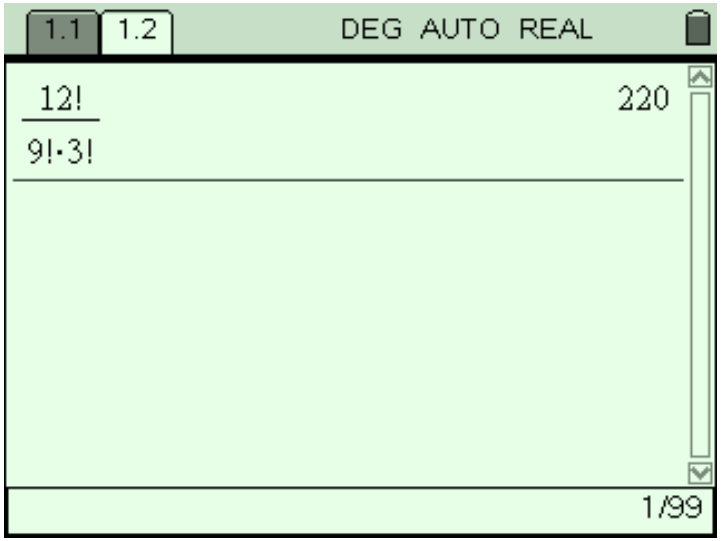
$$= \frac{12 \cdot 11 \cdot 10 \cdot 9!}{9! \cdot 3 \cdot 2 \cdot 1}$$

$$= 220$$

~~$12!/9!3!$~~ EVIL

Good

$12!/(9!3!)$



Ex) REWRITE AS A SINGLE FACTORIAL EXPRESSION:

a) $\dfrac{(n+4)!}{n+4}$

$= \dfrac{(n+4)\cdot(n+3)!}{(n+4)}$

$= (n+3)!$

$n=2$

$\dfrac{6!}{6}$

$\dfrac{6\cdot 5!}{6}$

b) $(n-2)(n-3)(n-4)!$

$= (n-2)!$

CHECK: $n=10$

$8\cdot 7\cdot 6!$

SIMPLIFY:

$$\frac{\frac{(x+1)!}{x!}}{\frac{x!}{x!}} = \frac{(x+1)\cdot x!}{x!}$$

$$= x+1$$

$x=5$ $\quad \frac{6!}{5!} =$

Ex) SIMPLIFY:

a) $\dfrac{(x+4)!}{(x+1)!} = \dfrac{(x+4)(x+3)(x+2)\cancel{(x+1)!}}{\cancel{(x+1)!}}$

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

SIMPLIFY:

b) $\dfrac{(x-2)!}{(x-1)!} = \dfrac{(x-2)!}{(x-1)(x-2)!} = \dfrac{1}{x-1}$

O.T.L.?

67

45

55

51

(45) $\frac{c^{-4}x}{t^{-1}} = \frac{1}{c^4} \cdot \frac{x}{1} \cdot \frac{t}{1}$

$= \frac{xt}{c^4}$

(51) $a^{-1}b + 3b^{-1}a$

$= \frac{b}{b}\frac{b}{a} + \frac{3a}{b}\cdot\frac{a}{a}$

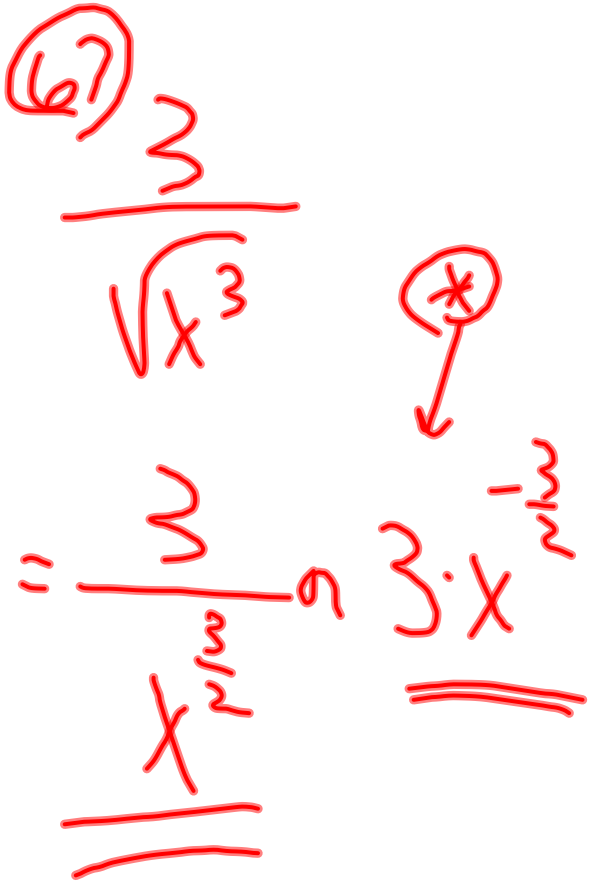
$= \frac{b^2}{ab} + \frac{3a^2}{ab}$

$= \frac{3a^2+b^2}{ab}$

(55) $-\frac{1}{2}\cdot x^{-2}$

$= -\frac{1}{2}\cdot\frac{1}{x^2}$

$= \frac{-1}{2x^2}$



O.T.L.

- CORRECT TODAY'S O.T.L.
- P.52 71-79 (ODD)
- P.54 1-9 (ODD)