PRECALC – BE | WEDNESDAY 2-10-10

1. $(\sqrt{2})^3 = ?$

2. $\left(\frac{1}{2}\right)^4 = ?$

3. $0! = ?$

4. $(8x^3)^0 = ?$

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1. $2\sqrt{2}$ 2. $\frac{1}{16}$ 3. 1 4. 1

Group Practice: Pg. 804 # 23, 25, 29

PRECALC –

Homework Review: Pg. 804 # 9, 10, 22

(9) * 6^{th} term of $(a-b)^7$ $\therefore N=7$, $r=5$ *

$$(x+y)^N = \sum_{r=0}^{N} \frac{N!}{r!(N-r)!} x^{N-r} y^r$$

(a) $(-b)$

$$= \frac{7!}{5!(2!)} (a)^2 (-b)^5$$

↑ STAYS NEGATIVE; ↑ ODD power

$$= \frac{7 \cdot 6}{2} a^2 - b^5 = \boxed{-21a^2b^5}$$

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(10) * 4^{th} term of $(x+\sqrt{3})^9$ $\therefore N=9$ $r=3$ *

$$(x+y)^N = \sum_{r=0}^{N} \frac{N!}{r!(N-r)!} x^{N-r} y^r$$

(x) $(\sqrt{3})$

$$= \frac{9!}{3!6!} x^6 (\sqrt{3})^3$$

$\sqrt{3}\sqrt{3}\sqrt{3} = 3\sqrt{3}$

$$= \frac{\overset{3}{9} \cdot \overset{4}{8} \cdot 7}{\underset{1}{3} \cdot \underset{1}{2}} \cdot x^6 \cdot 3\sqrt{3}$$

$$= 12 \cdot 7 \cdot 3x^6\sqrt{3} = \boxed{252x^6\sqrt{3}}$$

$84 \times 3 = 252$

(22) $\left(\frac{1}{2}N+2\right)^5$ } $(X+Y)^N = \sum_{r=0}^{N} \frac{N!}{r!(N-r)!} X^{N-r} Y^r$

$X \to \left(\frac{1}{2}N\right)$, $Y \to (2)$

$$\Rightarrow \sum_{r=0}^{5} \frac{5!}{r!(5-r)!} \left(\frac{1}{2}N\right)^{5-r} (2)^r$$

$$= \underbrace{\frac{5!}{0!\,5!}\left(\frac{1}{2}N\right)^5 (2)^0}_{r=0} + \underbrace{\frac{5!}{1!(4!)}\left(\frac{1}{2}N\right)^4 (2)^1}_{r=1}$$

$$= \underbrace{\frac{5!}{2!\,3!}\left(\frac{1}{2}N\right)^3 (2)^2}_{r=2} + \underbrace{\frac{5!}{3!\,2!}\left(\frac{1}{2}N\right)^2 (2)^3}_{r=3}$$

$$= \underbrace{\frac{5!}{4!(1!)}\left(\frac{1}{2}N\right)^1 (2)^4}_{r=4} + \underbrace{\frac{5!}{5!(0!)}\left(\frac{1}{2}N\right)^0 (2)^5}_{r=5}$$

$$\frac{1}{32}N^5 + \frac{5}{16}N^4(2) + \frac{10}{8}N^3(4) + \frac{10}{4}N^2(8) \cdots$$

$$+ \frac{5}{2}N(16) + 32$$

$$= \boxed{\frac{1}{32}N^5 + \frac{5}{8}N^4 + 5N^3 + 20N^2 + 40N + 32}$$