FJ started a 30 day treatment program which involved daily injections of a medication. The first day's injection SCORE: _____ / 5 PTS was 12 mg, and each subsequent day's injection was 5% less than the previous day's injection. Find the total amount of the injections.

Your final answer may <u>NOT</u> use ... <u>NOR</u> \sum . It may use +, -, \times , \div and powers. (It does <u>NOT</u> need to be simplified into a single number.)

$$a_n = AMOUNT OF INSECTION ON NTH DAY
$$a_1 = 12$$

$$a_2 = 12(1-0.05) = 12(0.95)$$

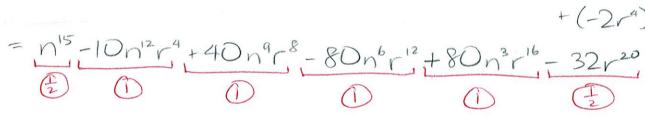
$$a_3 = 12(0.95)^2$$

$$a_n = 12(0.95)^{n-1}$$

$$a_n = 12(0.95)^{n-1}$$$$

Use Pascal's Triangle to expand and simplify $(n^3 - 2r^4)^5$. SCORE: _____/5 PTS

$$(n^3)^5 + 5(n^3)^4(-2r^4) + 10(n^3)^3(-2r^4)^2 + 10(n^3)^2(-2r^4)^3 + 5(n^3)(-2r^4)^4 + (-2r^4)^5$$



Using the formulae for the sums of the powers of integers in your textbook, find the sum $\sum_{n=1}^{\infty} (2-5n+3n^2)$. SCORE: _____/4 PTS

Your final answer may <u>NOT</u> use ... <u>NOR</u> \sum . It may use +, -, ×, ÷. (It does <u>NOT</u> need to be simplified into a single number.)

$$\frac{240}{2} 2 - 5 \sum_{n=1}^{240} n + 3 \sum_{n=1}^{240} n^{2}$$

$$= 240 \cdot 2 - 5 \cdot \frac{240(241)}{2} + 3 \cdot \frac{240(241)(481)}{6}$$

	ction to prove that is 3 a factor of $n^3 + 6n^2 + 8n$ for all positive integers n . SCORE:/10 PTS
BASIS STEP:	315 A FACTOR OF 13+6(1) +8(1)=151 MUST HAVE WORD INTEGER! (1)
INDUCTIVE :	ASSUME 3 IS A FACTOR OF K+6K+8KI
STEP	FOR SOME PARTICULAR BUT ARBITRARY INTEGER RE
	[PROVE 3 15 A FACTOR OF (K+1)3+6(K+1)2+8(K+1)]
	(4+1)3+6(k+1)2+8(k+1), (1)
	$= k^3 + 3k^2 + 3k + 1$
	+6k2+12k+6
	+ 8 K + 8
	$=(k^2+6k^2+8k)+(3k^2+15k+15)$
	$= (k^{2}+6k^{2}+8k)+3(k^{2}+5k+5)(2)$
	SINCE 3 IS A FACTOR OF BOTH (k3+6k2+8k)
	SINCE 3 IS A FACTOR OF BOTH (k3+6k2+8k) (1) AND 3(k2+5k+5)
	THEREFORE 315 A FACTOR OF (K+1) + 6(K+1) + 8(K+1)
	50, 3 15 A FACTOR OF n3+6n2+8n, (2)
	FOR ALL INTEGERS N > 1, (2)

Find the rational number representation of the repeating decimal 0.427 using the method discussed in lecture.

SCORE: _____/6 PTS

$$0.4 + 0.027 + 0.00027 + 0.0000027 + ..., 0$$

$$= \frac{4}{10} + 0.027$$

$$= \frac{4}{10} + \frac{27}{1000}$$

$$= \frac{4}{10} + \frac{27}{1000}$$

$$= \frac{4}{10} + \frac{27}{1000} \cdot \frac{100}{99}$$

$$= \frac{4}{10} + \frac{27}{1000} \cdot \frac{100}{99}$$

NOTE: Only the 27 is repeated.