Final Prep : Early material

① What is an arithmetic sequence?

② What is a geometric sequence?

③ What's the 170^{th} term of $3, 5, 7, 9, \ldots$?

④ What's the 214^{th} term of $-5, 15, -45, 135, \ldots$?

⑤ For which kinds of sequences do you know how to find the sum of the first k terms?

⑥ For which kinds of sequences have we learned how to find the sum of all the terms?

⑦ What's the sum of the first 40 terms of $-7, -4, -1, 2, \ldots$?

⑧ What's $\sum_{i=1}^{\infty} \frac{7}{5^i}$?

⑨ Find $\sum_{i=1}^{3} (1-i^2)$

⑩ Find $\sum_{i=1}^{30} 5$

⑪ How many ways are there to order a set of 48 objects?

⑫ How many ways can you choose and then order 17 objects from a set of 58 objects?

⑬ How many subsets of a set of 98 objects contain exactly 23 objects?

⑭ What does "options multiply" mean?

⑮ Write $\binom{7}{4}$ as a natural number in standard form.

(16) $f(x)=x^2+2$, $g(x)=3x-1$. Find $fog(x)$ and $gof(x)$.

(17) $f(x)=2(x-4)^3+1$. Find $f^{-1}(y)$.

(18) What are the implied domains of the following functions:

$f(x)=x$

$f(x)=x^2$

$f(x)=x^3$

$f(x)=4$

$f(x)=\sqrt[2]{x}$

$f(x)=\sqrt[3]{x}$

$f(x)=1/x$

$f(x)=e^x$

$f(x)=\log_e(x)$

(19) What's the implied domain of $f(x) = \frac{27}{3}x^5 - 3x^2 + 27$?

(20) What's the implied domain of $r(x) = \frac{3x-7}{x^2-4}$?

(21) What's the implied domain of $g(x) = \frac{1}{e^x}$?

(22) What's the implied domain of $\sqrt[2]{7-x}$?

(23) What's the implied domain of $5x^2 - \sqrt[3]{2x-3}$?

(24) What's the implied domain of $2x - \log_e(3x+4)$?

(25) What's the implied domain of $e^{\sqrt[3]{5x-2}} + 3x^2 - 5$?