Name: _____

F.LE.A.3: Families of Functions

1 As x increases beyond 25, which function will have the largest value?
1) $f(x) = 1.5^x$
2) $g(x) = 1.5x + 3$
3) $h(x) = 1.5x^2$
4) $k(x) = 1.5x^3 + 1.5x^2$

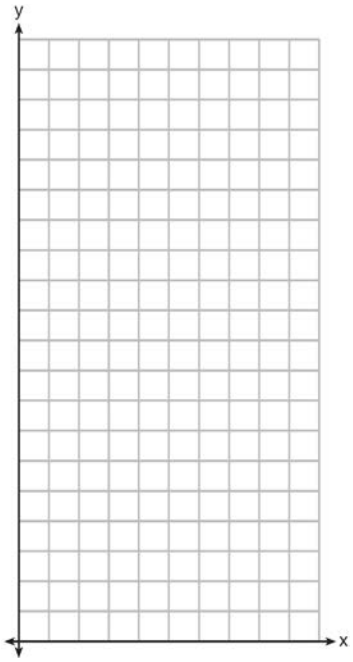
2 If $f(x) = 3^x$ and $g(x) = 2x + 5$, at which value of x is $f(x) < g(x)$?
1) -1
2) 2
3) -3
4) 4

3 What is the largest integer, x, for which the value of $f(x) = 5x^4 + 30x^2 + 9$ will be greater than the value of $g(x) = 3^x$?
1) 7
2) 8
3) 9
4) 10

4 Alicia has invented a new app for smart phones that two companies are interested in purchasing for a 2-year contract. Company A is offering her \$10,000 for the first month and will increase the amount each month by \$5000. Company B is offering \$500 for the first month and will double their payment each month from the previous month. Monthly payments are made at the end of each month. For which monthly payment will company B's payment first exceed company A's payment?
1) 6
2) 7
3) 8
4) 9

5 Michael has \$10 in his savings account. Option 1 will add \$100 to his account each week. Option 2 will double the amount in his account at the end of each week. Write a function in terms of x to model each option of saving. Michael wants to have at least \$700 in his account at the end of 7 weeks to buy a mountain bike. Determine which option(s) will enable him to reach his goal. Justify your answer.

6 Graph $f(x) = x^2$ and $g(x) = 2^x$ for $x \geq 0$ on the set of axes below.

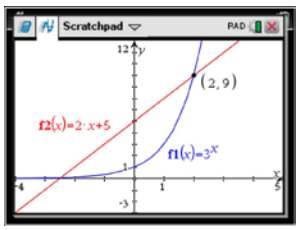


State which function, $f(x)$ or $g(x)$, has a greater value when $x = 20$. Justify your reasoning.

F.LE.A.3: Families of Functions
Answer Section

1 ANS: 1 REF: 081618ai

2 ANS: 1



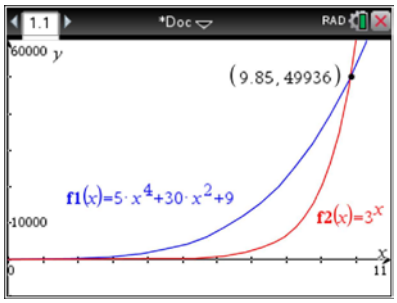
$f(-1) < g(-1)$

$3^{-1} < 2(-1) + 5$

$\frac{1}{3} < 3$

REF: 061515ai

3 ANS: 3



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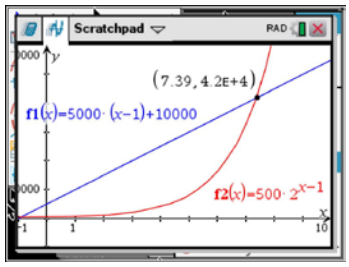
4 ANS: 3



x	$A = 5000(x-1)+10000$	$B = 500(2)^{x-1}$
6	35,000	16,000
7	40,000	32,000
8	45,000	64,000
9	50,000	128,000

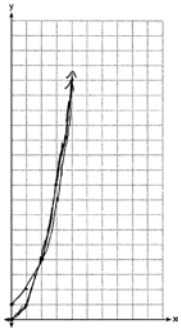
REF: 081518ai

5 ANS:

$f(x) = 10 + 100x$, $g(x) = 10(2)^x$; both, since $f(7) = 10 + 100(7) = 710$ and $g(7) = 10(2)^7 = 1280$

REF: 061736ai

6 ANS:



$g(x)$ has a greater value: $2^{20} > 20^2$

REF: 081533ai