3.1 Scott's March Madness

## A Develop Understanding Task

Each year, Scott participates in the "Macho March" promotion. The goal of "Macho March" is to raise money for charity by finding sponsors to donate based on the number of push-ups completed within the month. Last year, Scott was proud of the money he raised, but was also determined to increase the number of push-ups he would complete this year.

Part I: Revisiting the Past

Below is the bar graph and table Scott used last year to keep track of the number of push-ups he completed each day, showing he completed three push-ups on day one and five push-ups (for a combined **total** of eight push-ups) on day two. Scott continued this pattern throughout the month.
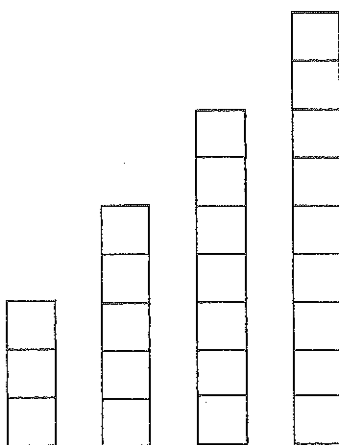
n Days	$f(n)$ Push-ups each **day**	$g(n)$ **Total** number of pushups in the month
1	3	3
2	5	8
3	7	15
4	9	24
5	11	35
...	...	
n		

1. Write the recursive and explicit equations for the number of push-ups Scott completed **on any given day** last year. Explain how your equations connect to the bar graph and the table above.

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2. Write the recursive and explicit equation for the **accumulated total number of push-ups Scott completed by any given day** during the "Macho March" promotion last year.

Part II: March Madness

This year, Scott's plan is to look at the total number of push-ups he *completed for the month* last year

n Days	$f(n)$ Push-ups each day last year	$g(n)$ Total number of pushups in the month	$m(n)$ Push-ups each day this year	$T(n)$ Total push-ups completed for the month
1	3	3	3	
2	5	8	8	
3	7	15	15	
4	9	24		
5				
...	...			
n				

$(g(n))$ and do that many push-ups each day $(m(n))$.

3. How many push-ups will Scott complete on day four? How did you come up with this number? Write the recursive equation to represent the total number of push-ups Scott will complete for the month on any given day.

4. How many **total** push-ups will Scott complete for the month on day four?

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5. Without finding the explicit equation, make a conjecture as to the type of function that would represent the explicit equation for the total number of push-ups Scott would complete on any given day for this year's promotion.

6. How does the rate of change for this explicit equation compare to the rates of change for the explicit equations in questions 1 and 2?

7. Test your conjecture from question 5 and justify that it will always be true (see if you can move to a generalization for all polynomial functions).

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Name   Period   Date

READY

Topic: Completing inequality statements

For each problem, place the appropriate inequality symbol between the two expressions to make the statement true.

If a > b, then:

1. $3a$ ___ $3b$

2. $b - a$ ___ $a - b$

3. $a + x$ ___ $b + x$

If x > 10, then:

4. x^2 ___ 2^x

5. $\sqrt{x}$ ___ x^2

6. x^2 ___ x^3

If 0 < x < 1

7. x ___ x^2

8. $\sqrt{x}$ ___ x

9. x ___ $3x$

SET

Topic: Classifying functions

Identify the type of function for each problem. Explain how you know.

10.

x	$f(x)$
1	3
2	6
3	12
4	24
5	48

11.

x	$f(x)$
1	3
2	6
3	9
4	12
5	15

12.

x	$f(x)$
1	3
2	9
3	18
4	30
5	45

13.

x	$f(x)$
1	7
2	9
3	13
4	21
5	37

14.

x	$f(x)$
1	-26
2	-19
3	0
4	37
5	98

15.

x	$f(x)$
1	-4
2	3
3	18
4	41
5	72

16. Which of the above functions are NOT polynomials?

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GO
Topic: Recalling long division and the meaning of a factor

Find the quotient without using a calculator. If you have a remainder, write the remainder as a whole number. Example: $21\overline{)149}$ with quotient 7 remainder 2

17. $30\overline{)510}$

18. $13\overline{)8359}$

19. Is 30 a factor of 510? How do you know?

20. Is 13 a factor of 8359? How do you know?

21. $22\overline{)14857}$

22. $952\overline{)40936}$

23. Is 22 a factor of 14587? How do you know?

24. Is 952 a factor of 40936? How do you know?

25. $92\overline{)3405}$

26. $27\overline{)3564}$

27. Is 92 a factor of 3405?

28. Is 27 a factor of 3564?

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