F-LE.A: Skills Practice Problems

3.4 #7-12

Write a linear function to represent each problem situation.

7. A cereal manufacturer has two production lines. Line A produces a variety of cereal that is sold for $3 per box. Line A typically produces 4 boxes per day that do not meet company standards and cannot be sold. Line B produces a variety of cereal that is sold for $2 per box. Line B typically produces 6 boxes per day that do not meet company standards and cannot be sold. Line A and Line B produce the same total number of boxes each day.

   The linear functions $a(x) = 3(x - 4)$ and $b(x) = 2(x - 6)$ represent the total amount each line can produce taking into account the boxes that do not meet company standards and cannot be sold. Write a linear function that represents the total number of boxes the lines can produce combined.

   Line A: $\frac{1}{2}x$ $a(x) = 3\left(\frac{1}{2}x - 4\right)$

   Line B: $\frac{1}{2}x$ $b(x) = 2\left(\frac{1}{2}x - 6\right)$

   $c(x) = a(x) + b(x)$

   $= 3\left(\frac{1}{2}x - 4\right) + 2\left(\frac{1}{2}x - 6\right)$

   $= \frac{3}{2}x - 12 + \frac{2}{2}x - 12$

   $= \frac{5}{2}x - 24$

   The linear function $c(x) = \frac{5}{2}x - 24$ represents the total number of boxes that Line A and Line B can produce combined.

8. A pretzel manufacturer has two production lines. Line A produces a variety of pretzel that is sold for $2.40 per bag. Line A typically produces 3 bags per day that do not meet company standards and cannot be sold. Line B produces a variety of pretzel that is sold for $3.60 per bag. Line B typically produces 4 bags per day that do not meet company standards and cannot be sold. Line A produces 3 times as many bags as Line B each day.

   The linear functions $a(x) = 2.4(x - 3)$ and $b(x) = 3.6(x - 4)$ represent the total number of bags each line can produce taking into account the bags that do not meet company standards and cannot be. Write a linear function that represents the total number of bags the lines can produce combined.

9. Carlos has a roadside stand that sells peaches. He sells his peaches for $1.99 per pound. He typically loses 5 pounds per week to spoilage. Hector also has a roadside stand that sells peaches. He sells his peaches for $2.49 per pound. He typically only loses 1 pound per week to spoilage. Carlos' stand sells twice as many peaches per week as Hector's stand.

   The linear functions $c(x) = 1.99(x - 5)$ and $h(x) = 2.49(x - 1)$ represent the total amount each stand can earn taking into account the peaches lost to spoilage. Write a linear function that represents the total amount that Carlos and Hector can earn combined.

10. A lamp manufacturer has two production lines. Line A produces a lamp model that is sold for $24.99 each. Line A typically produces 2 lamps per day that do not meet company standards and cannot be sold. Line B produces a lamp model that is sold for $34.99 each. Line B typically produces 1 lamp per day that does not meet company standards and cannot be sold. Line A produces half as many lamps as Line B each day.

    The linear functions $a(x) = 24.99(x - 2)$ and $b(x) = 34.99(x - 1)$ represent the total number of lamps each line can produce taking into account the lamps that do not meet company standards and cannot be sold. Write a linear function that represents the total number of lamps the lines can produce combined.

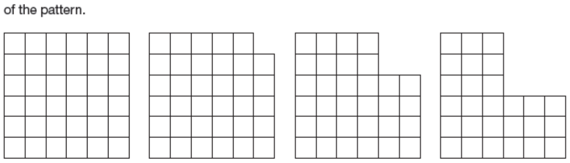
11. A jean manufacturer has two production lines. Line A produces a style that is sold for $42 each. Line A typically produces 2 pairs per day that do not meet company standards and cannot be sold. Line B produces a style that can be sold for $65 each. Line B typically produces 3 pairs per day that do not meet company standards and cannot be sold. Line A produces three times as many pairs of jeans as Line B each day.

    The linear functions $a(x) = 42(x - 2)$ and $b(x) = 65(x - 3)$ represent the total number of pairs of jeans that each line can produce taking into account the jeans that do not meet company standards and cannot be sold. Write a linear function that represents the total number of pairs of jeans the lines can produce combined.

12. Jada makes and sells handmade puzzles for $32 each. Each month she donates 2 puzzles to a retirement community. Ronna also makes and sells handmade puzzles for $28 each. Each month she donates 2 puzzles to a childcare center. Jada and Ronna make the same number of puzzles each month.

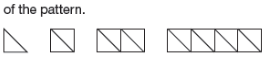
    The linear functions $j(x) = 32(x - 2)$ and $r(x) = 28(x - 2)$ represent the total amount each girl can earn taking into account the puzzles that are donated and not sold. Write a linear function that represents the total amount Jada and Ronna can earn combined.

14. Write a numeric sequence to represent the number of squares in each of the first 6 figures of the pattern.



15. Leonardo uses 3 cups of flour in each cake he bakes. He starts the day with 50 cups of flour. Write a numeric sequence to represent the amount of flour remaining after each of the first 7 cakes Leonardo bakes. Include the amount of flour Leonardo started with.

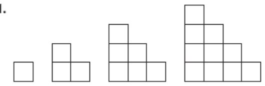
16. Write a numeric sequence to represent the number of triangles in each of the first 7 figures of the pattern.



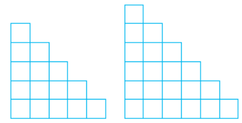
4.1 #1-16

Describe each given pattern. Draw the next two figures in each pattern.

1.



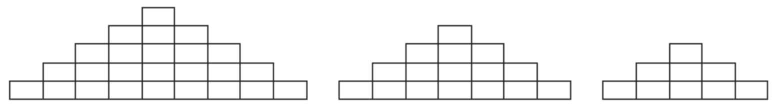
The second figure has 2 more squares than the first, the third figure has 3 more squares than the second, and the fourth figure has 4 more squares than the third.



2.

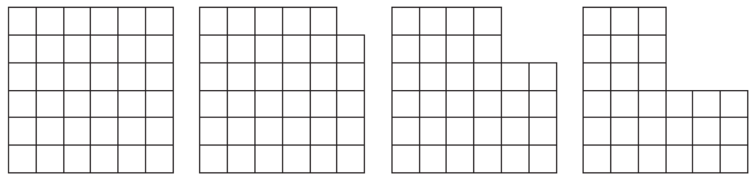
3.

4.



5.

6.

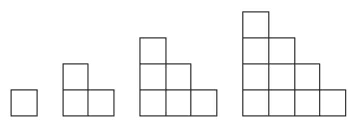


Write a numeric sequence to represent each given pattern or situation.

7. The school cafeteria begins the day with a supply of 1000 chicken nuggets. Each student that passes through the lunch line is given 5 chicken nuggets. Write a numeric sequence to represent the total number of chicken nuggets remaining in the cafeteria's supply after each of the first 6 students pass through the line. Include the number of chicken nuggets the cafeteria started with.

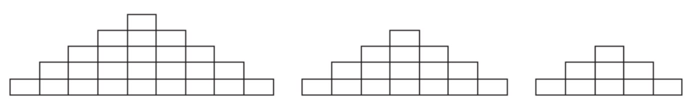
   1000, 995, 990, 985, 980, 975, 970

8. Write a numeric sequence to represent the number of squares in each of the first 7 figures of the pattern.



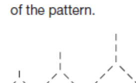
9. Sophia starts a job at a restaurant. She deposits $40 from each paycheck into her savings account. There was no money in the account prior to her first deposit. Write a numeric sequence to represent the amount of money in the savings account after Sophia receives each of her first 6 paychecks.

10. Write a numeric sequence to represent the number of blocks in each of the first 5 figures of the pattern.



11. Kyle is collecting canned goods for a food drive. On the first day he collects 1 can. On the second day he collects 2 cans. On the third day he collects 4 cans. On each successive day, he collects twice as many cans as he collected the previous day. Write a numeric sequence to represent the total number of cans Kyle has collected by the end of each of the first 7 days of the food drive.

12. Write a numeric sequence to represent the number of line segments in each of the first 7 figures of the pattern.



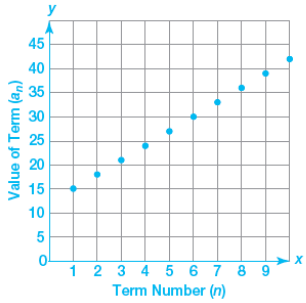
13. For her 10th birthday, Tameka's grandparents give her a set of 200 stamps. For each birthday after that, they give her a set of 25 stamps to add to her stamp collection. Write a numeric sequence consisting of 7 terms to represent the number of stamps in Tameka's collection after each of her birthdays starting with her 10th birthday.

4.4 #1-10

Complete the table for each given sequence then graph each sequence on the coordinate plane.

1. $a_n = 15 + 3(n - 1)$

Term Number (n)	Value of Term (a_n)
1	15
2	18
3	21
4	24
5	27
6	30
7	33
8	36
9	39
10	42



2. $g_n = 3 \cdot 2^{n-1}$

Term Number (n)	Value of Term (g_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

3. $a_n = 50 + (-8)(n - 1)$

Term Number (n)	Value of Term (a_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

4. $g_n = 3 \cdot (-2)^{n-1}$

Term Number (n)	Value of Term (g_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

5. $a_n = -24 + 6(n - 1)$

Term Number (n)	Value of Term (a_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

6. $g_n = -1 \cdot 2^{n-1}$

Term Number (n)	Value of Term (g_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

7. $a_n = 75 + 25(n - 1)$

Term Number (n)	Value of Term (a_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

8. $g_n = 32{,}000 \cdot (0.5)^{n-1}$

Term Number (n)	Value of Term (g_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

9. $a_n = 400 + (-80)(n - 1)$

Term Number (n)	Value of Term (a_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

10. $g_n = 2 \cdot (-3)^{n-1}$

Term Number (n)	Value of Term (g_n)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

5.6 #33-38: Write the exponential function represented by the table of values. ***REVIEW LINEAR AS WELL!***

33.

x	y
0	2
1	1
2	$\frac{1}{2}$
3	$\frac{1}{4}$

$f(x) = a \cdot b^x$
$f(x) = 2 \cdot b^x$
$1 = 2 \cdot b^1$
$\frac{1}{2} = b$
$f(x) = 2\left(\frac{1}{2}\right)^x$

34.

x	y
0	1
2	25
4	625
6	15625

35.

x	y
0	1
1	$\frac{3}{4}$
2	$\frac{9}{16}$
3	$\frac{27}{64}$

36.

x	y
0	-1
2	-4
4	-16
6	-64

37.

x	y
0	3
3	$\frac{1}{9}$
6	$\frac{1}{243}$
9	$\frac{1}{6561}$

38.

x	y
0	-2
1	$-\frac{1}{2}$
2	$-\frac{1}{8}$
3	$-\frac{1}{32}$

<u>WS of Word Problems</u>

1. A roofer is nailing shingles to the roof of a house in rows. There are three shingles in the top row. Since the roof widens from top to bottom, three additional shingles are needed in each successive row.
(a) Is this an arithmetic or geometric sequence? Explain why. (b) Write the explicit rule. (c) Write the recursive rule.

2. You want to save $30 to buy a jacket. You begin by saving a dollar in the first week. You plan to save an additional dollar each week after that. For example, you will save $2 in the second week, $3 in the third week, and so on.
(a) Is this an arithmetic or geometric sequence? Explain why. (b) Write the explicit rule. (c) Write the recursive rule.

3. To prove that objects of different weights fall at the same rate, Galileo dropped two objects with different weights from the Leaning Tower of Pisa in Italy. The objects hit the ground at the same time. When an object is dropped from a tall building, it falls about 16 feet in the 1st second, 48 feet in the 2nd second, and 144 feet in the 3rd second, regardless of its weight.
(a) Is this an arithmetic or geometric sequence? Explain why. (b) Write the explicit rule. (c) Write the recursive rule.

4. A one-ton ice sculpture is melting so that it loses one-fifth of its weight per hour.
(a) Is this an arithmetic or geometric sequence? Explain why. (b) Write the explicit rule. (c) Write the recursive rule.

5. Write the exponential OR LINEAR function represented by the table of values.

x	y
0	1
1	¾
2	$^9/_{16}$
3	$^{27}/_{64}$

x	y
0	4
1	15
2	26
3	37

x	y
0	-1
2	-4
4	-16
6	-64