Grade 6 Math

Date: _Oct. 22_

What's missing?

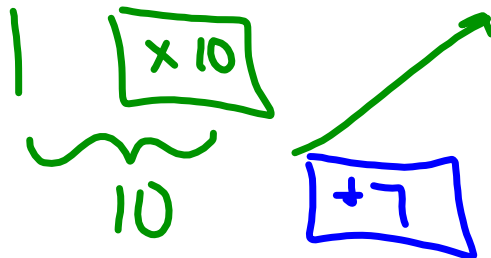| input	output
1	17
2	27
3	37
4	47
5	57
6	67

1↻ ⟩10

* What is the input rule:
Start at 1 and add 1 each time.

* What is the output rule:
Start at 17 and add 10 each time.

* What is the pattern rule that relates the input to the output (Write as an expression to represent the pattern using "n")

→ Multiply input by 10 then add 7 to get output.

n [X 10] [+7]

Check n = 1 out = 17

1 [× 10]
     10   [+7]

Homework Solutions

Page 22 #1abcd, #2abcd

TIP **Practice** ....

1. Kilee builds model cars.
   She needs 4 plastic wheels for each car she builds.
   a) Make a table to show the number of wheels
      needed for 1, 2, 3, 4, and 5 cars.
   b) Write a pattern rule that relates the number
      of cars to the number of wheels.
   c) Write an expression to represent the pattern.
   d) Find the number of wheels needed to build 11 cars.
      How can you check your answer?

a)

# of cars	# of wheels
1	4
2	8
3	12
4	16
5	20

b) The number of wheels is 4 times the number cars

equation

c) W = 4 x C   where W is # of wheels

where c is the number of cars

expression is 4 x C

d) 4 x c

4 x 11

44   11 cars will have 44 wheels

2. For each table of values, write an expression that relates the input to the output.

$n \boxed{X3} \boxed{+2}$ $n \boxed{X4} \boxed{-2}$

a)

Input	Output
	0
2	2
3	4
4	6
5	8

b)

Input	Output
1	5
2	8
3	11
4	14
5	17

c)

Input	Output
1	2
2	6
3	10
4	14
5	18

$\frac{\Delta out}{\Delta in} : \frac{2}{1} = 2$

2n
2 x 1 = 2

not 0 so need to subtract 2

$\boxed{2 \times n - 2}$ or 2n - 2

if input is 4 then output has to be
check 4 x 2 - 2

8 - 2

6

$\frac{\Delta out}{\Delta in} : \frac{3}{1} = 3$

3n ___

for input=1 output is 5

3 x 1

3   so need to

add 2 to get 5

3n + 5   or 3 x n + 5

check for input =4

output is 14

3x4 +2

12 + 2

14 so works

$\frac{\Delta out}{\Delta in} \quad \frac{4}{1} = 4$

4n ___

for input=1 output is 2

4 x 1

4   so need to

subtract 2 to get 2

4n - 2   or 4 x n - 2

check for input =4

output is 14

4x4 +2

16 + 2

14 so works
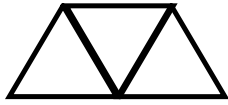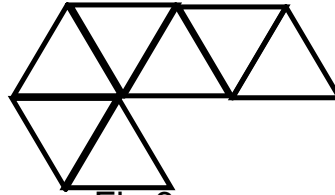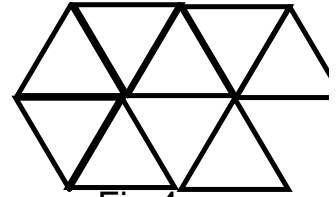
Fig 1   Fig 2   Fig 3   Fig 4

a) Make a table to show the [number of triangles] in the first 4 figures.

let n represent figure #

Fig	# of △
1	3
2	5
3	7
4	9

n [X2] [+1]

Check
n=1   #△=3

1 [X2] [+1]
2

b) Write a pattern rule that relates the figure number to the number of triangles (words)

multiply figure # by 2 then add 1 to get # of △.

c) Write an expression to represent the pattern (no boxes)

$2n + 1$ or $n \times 2 + 1$

d) Find the number of triangles in the 10th figure. Which strategy did you use?

n=10   #△=?

$2n + 1$

$= 2(10) + 1$

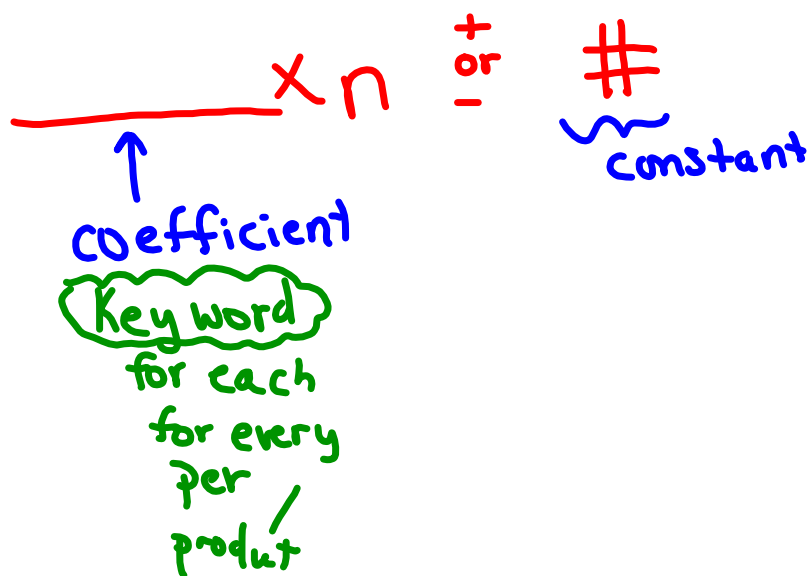$= 20 + 1$

$= 21$

There will be 21 △s in figure 10.

Study <u>Key words</u>

Adding → Sum, more, add, greater, increase
—Deposit (money)

Subtraction → Difference, less, subtract, decrease, minus
→ withdraw (money)

Multiply → product, for each, for every, per, /

divide → quotient, share, split, half, a quarter
grouping

Ex) $5/hr
$\frac{1}{4}$

$$\underline{\qquad} \times n \quad \overset{+}{\underset{-}{or}} \quad \#$$

coefficient

constant

Key word

for each
for every
per
product /

Which expression below represents this number pattern in the chart?

Figure #	Number of shapes
1	16
2	19
3	22
4	25

1( )3

×3

$3n$

$3f$

a) f + 16

b) 4f + 11

c) f + 3

d) 3f + 13

Class work / Homework

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#3, #4, #5, #6

on board   on own
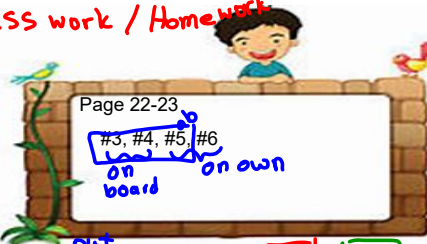
a)

In Figure	out # of □
1	5
2	7
3	9
4	11

a) X2   +3

Check
Fig=1   # of □ = 5
1 X2
      +3
2
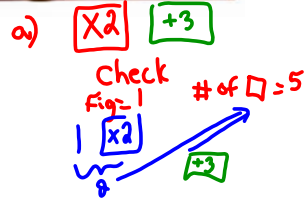
b)
→ Multiply Figure # by 2, then add 3 to get # of Squares.

c) 2f + 3   or   f x 2 + 3

d) f=7   # of □ = ?

2(7) + 3
14 + 3
17

Figure 7 will have 17 squares.

4) a)

# hours	Amount $ Pledged
1	12
2	14
3	16
4	18
5	20

10 + 2
10 + 2 + 2
10 + 2 + 2 + 2
10 + 2 + 2 + 2 + 2

Hours X2

Check   Amount Pledge = 12
1 X2
      +10
2

hours X2 +10 = Amount Pledged

→ Multiply # of hours by 2 then add 10 to get amount Pledged.

Expression
a) 2h + 10

h=9
d) 2(9) + 10   If Tyson dances for 9 hours he will pledge $28.
18 + 10
28

TIP   **Practice**   •••

1. Kilee builds model cars.
   She needs 4 plastic wheels for each car she builds.
   a) Make a table to show the number of wheels
      needed for 1, 2, 3, 4, and 5 cars.
   b) Write a pattern rule that relates the number
      of cars to the number of wheels.
   c) Write an expression to represent the pattern.
   d) Find the number of wheels needed to build 11 cars.
      How can you check your answer?

2. For each table of values, write an expression that relates the input to the output.
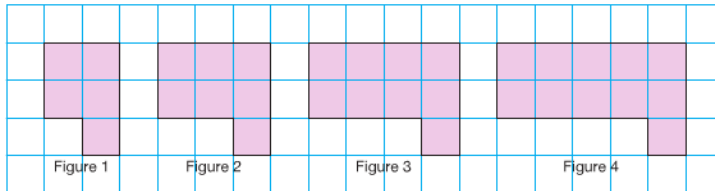
a)

Input	Output
1	0
2	2
3	4
4	6
5	8

b)

Input	Output
1	5
2	8
3	11
4	14
5	17

c)

Input	Output
1	2
2	6
3	10
4	14
5	18

3. Here is a pattern of squares on grid paper.

Figure 1   Figure 2   Figure 3   Figure 4

a) Make a table to show the numbers of squares in the first 4 figures.
b) Write a pattern rule that relates the figure number to the number of squares.
c) Write an expression to represent the pattern.
d) Find the number of squares in the 7th figure.
   Which strategy did you use?
   Continue the pattern to check your answer.

4. The Grade 6 class held a dance-a-thon to raise money to buy a new computer for the class. Tyson's friend, Alana, pledged $10, plus $2 for each hour Tyson danced.

   a) Make a table to show the amount Alana pledged for 1, 2, 3, 4, and 5 hours danced.

   b) Write a pattern rule that relates the amount pledged to the number of hours danced. Show your work.

   c) Write an expression to represent the pattern.

   d) Find how much Alana pledged when Tyson danced 9 h. What strategy did you use?

   e) Suppose Alana pledged $34. How many hours did Tyson dance? How did you find out?

5. The pattern in this table continues.
   a) Write a pattern rule that relates the number to the amount.
   b) Write an expression to represent the pattern.
   c) Write a story problem you could solve using the pattern. Solve your problem.

Number	Amount ($)
0	5
1	11
2	17
3	23
4	29

6. Skylar wants to adopt a whale through
   the BC Wild Killer Whale Adoption Program.
   The cost of a 1-year adoption is $59.
   Skylar walks his neighbour's dog to raise the money.
   He gets $3 for each walk.
   a) Make a table to show the amount left to raise
      after 1, 2, 3, 4, and 5 walks.
   b) Write a pattern rule that relates the number
      of walks to the amount left to raise.
   c) Write an expression to represent the pattern.
   d) Find the amount left to raise after 15 walks.
   e) After how many walks will Skylar have raised
      enough money? How do you know?