Curriculum Outcomes:

(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

(PR2) Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems.

Student Friendly: Being able to identify a linear pattern in a t-table.

Warm Up

Grade 9

Given the following t-table
i) Complete the table ✓
ii) Describe a the pattern ✓
iii) Write the equations and Expression ✓ ?
iv) Use your equation to determine how many circles would be in figure 500.

Figure # (x)	# Circles (y)
1	7
2	12
3	17
4	22
5	27
6	32
500	

+1, +1, +1 (Figure #) +5, +5, +5, +5 (Circles)

Pattern

Equations

$C = \frac{5f}{1} + 2$

Expression

$5f + 2$

$C = 5f + 2$

$C = 5(500) + 2$

$C = 2500 + 2$

$C = 2502$

T- Tables or Input/Output tables

x	y
0	5
2	9
4	13
6	17
8	21
.	
.	
100	

+2 +2 +2 +4 +4

Write an expression for the relationship

$2x+5$

Write an equations

$y=2x+5$

$y=2(100)+5$

$200+5$

205

A large water tower holds 15000 liters of water, however during the winter the water tower was damaged and started to leak. This table shows the amount of water every hour after it sprung the leak. The level of water changes at a constant rate.

Time (t hours)	Amount (A Liters)
0	15 000
1	14 800
2	14 600
3	14 400
4	14 200

-200 -200 -200 -200

i) Write an ***expression*** for the amount in terms of the time since the water tower began to leak.

$-200t + 15000$

ii) Write an ***equation*** that relates the amount of water to the time since it started leaking.

$A = -200t + 15000$

iii) How much water in the water tower after 10 hours?

$A = -200(10) + 15000$

$-2000 + 15000$

$A = 13000$

iv) When will the water tower be empty?

$-15000 \quad -15000$

$0 = -200t + 15000$

$\frac{-15000}{-200} = \frac{-200t}{-200}$

$75 = t$

A large water tower holds 15000 liters of water, however during the winter the water tower was damaged and started to leak. This table shows the amount of water every hour after it sprung the leak. The level of water changes at a constant rate.

Time (t hours)	Amount (A Liters)
0	15 000
1	14 800
2	14 600
3	14 400
4	14 200

-200, -200, -200, -200

$\frac{-200t}{1}$

i) Write an ***expression*** for the amount in terms of the time since the water tower began to leak.

$-200t + 15000$

ii) Write an ***equation*** that relates the amount of water to the time since it started leaking.

$A = -200t + 15000$

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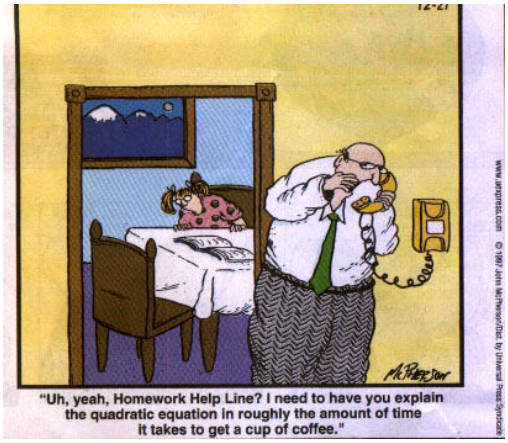


A Math tutor charges $15.75 for each hour and a fixed cost of $8.00.

i) Write an equation that relates the cost to the hours hired

Total Cost = 15.75 (h) + 8

Total = rate (h) + flat charge

ii) How much will a tutor cost for 4 hours?

Total Cost = 15.75 (h) + 8

= 15.75 (4) + 8

= 63 + 8

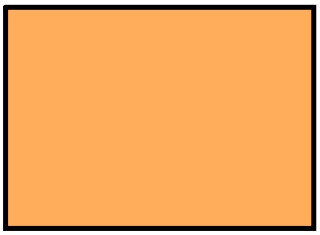
= 71

Try these

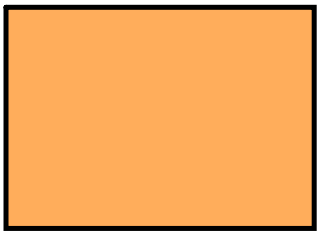
For n = 2, solve for each of the following

1) P = 5n +6

2) K = 4n-1

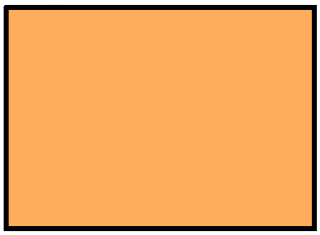


3) W= 10n - 5



For n = -5, solve for each of the following

1) P = 5n +6



2) K = 4n-1

3) W= 10n - 5