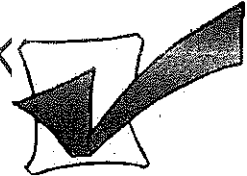


UNIT 2 TAKE HOME AND CHECK



** challenge problems

- 1) List the next three terms in this sequence, describe the pattern and then put the sequence into a table:

15625, 3125, 625, 125,

- 2) List the next three terms in this sequence and describe the pattern:

$$\frac{2}{3}, \frac{4}{3}, \frac{8}{3}, \frac{16}{3}$$

- 3) The preceding number is 60. Each succeeding number is 6 less than the preceding number.

- 4) Write as a power and use a calculator to solve:

$$\frac{2}{5} \cdot \frac{2}{5} \cdot \frac{2}{5} \cdot \frac{2}{5} \cdot \frac{2}{5} \cdot \frac{2}{5}$$

- 5) Find the value using a calculator:

$$\sqrt{676}$$

- 1) Divide preceding # by 5.

25, 5, 1

1	15625
2	3125
3	625
4	125

- 2) Multiply preceding fraction by 2.

$$\frac{32}{3}, \frac{64}{3}, \frac{128}{3}$$

- 3) 60, 54, 48, 42, 36, 30

4) $\left(\frac{2}{5}\right)^6 = \frac{64}{15,625}$

5) $\sqrt{676} = 26$

Evaluate: (no calc)

6) 9^0

7) 2^8

8) $4^4 + 2^2$

9) $3^2 - 6^2$

Evaluate without using a calculator:

10) $3[2^4 \div 4 - 2]$

11) $18 - 6 \div 2$

12) $20 - (2^5 \div 4^2) \cdot 6$

13) $7 - 15 \cdot 3 + 3^2$

6) 1

7) $2^8 = \boxed{256}$

8) $4^4 + 2^2 = 256 + 4 = \boxed{260}$

9) $3^2 - 6^2 = 9 - 36 = \boxed{-27}$

10) $3[2^4 \div 4 - 2]$

$3(16 \div 4 - 2)$

$3(4 - 2)$

$3(2)$

$\boxed{6}$

11) $18 - 6 \div 2$

$18 - 3$

$\boxed{15}$

12) $20 - (2^5 \div 4^2) \cdot 6$

$20 - (32 \div 16) \cdot 6$

$20 - 2 \cdot 6$

$20 - 12$

$\boxed{8}$

13) $7 - 15 \cdot 3 + 3^2$

$7 - 15 \cdot 3 + 9$

$7 - 45 + 9$

$-38 + 9$

$\boxed{-29}$

$$14) 24 + (3^2 \div 3) \cdot 11$$

Evaluate the expressions when

$$A = -2, b = 5$$

$$15) b - a$$

$$16) a^2 \cdot b$$

$$17) -a - b$$

$$18) (4b) \div (2a)$$

$$19) -a^3$$

$$20) b(9 + a)$$

$$\begin{aligned} 14) & 24 + (3^2 \div 3) \cdot 11 \\ & 24 + (9 \div 3) \cdot 11 \\ & 24 + 3 \cdot 11 \\ & 24 + 33 \\ & \boxed{57} \end{aligned}$$

$$\begin{aligned} 15) & b - a \\ & 5 - (-2) \\ & 5 + 2 = \boxed{7} \end{aligned}$$

$$\begin{aligned} 16) & a^2 \cdot b \\ & (-2)^2 \cdot 5 \\ & 4 \cdot 5 = \boxed{20} \end{aligned}$$

$$\begin{aligned} 17) & (-1)(-2) - 5 \\ & 2 - 5 = \boxed{-3} \end{aligned}$$

$$\begin{aligned} 18) & [(4)(5)] \div [(2)(-2)] \\ & 20 \div -4 \\ & \boxed{-5} \end{aligned}$$

$$\begin{aligned} 19) & (-1)(-2)(-2)(-2) \\ & \boxed{8} \end{aligned}$$

$$\begin{aligned} 20) & 5(9 + -2) \\ & 5(7) \\ & \boxed{35} \end{aligned}$$

- 21) I am making a beaded bracelet. Between beads I am putting little square picture frames that have an area of 9cm^2 . I want to cover the squares' perimeters with pink borders. How much border should I buy?

$$21) \square A = 9\text{cm}^2$$

$$\sqrt{9} = 3$$

each side = 3cm

$$4 \text{ sides} = 3 \times 4 =$$

12 cm of border

- 22) The train that goes through Medfield travels at 22 miles/hour. It goes 176 miles. How long does it take? (you may use a calculator)

$$22) D = RT$$

$$T = \frac{D}{R}$$

$$T = \frac{176}{22} = \boxed{8 \text{ hrs.}}$$

**23) $3 \cdot \frac{2 \cdot 4 + 1 \cdot 5^2}{2 + 2} - 6$

$$23) 3 \cdot \frac{2 \cdot 4 + 1 \cdot 25}{4} - 6$$

$$3 \cdot \frac{8 + 1 \cdot 25}{4} - 6$$

$$3 \cdot \frac{8 + 25}{4} - 6$$

$$3 \cdot \frac{33}{4} - 6$$

$$\frac{99}{4} - 6 =$$

$$24\frac{3}{4} - 6 = \boxed{18\frac{3}{4}}$$

**24) $-15 \div 4 + 3\frac{1}{4}$

$$24) -15 \div 4 + 3\frac{1}{4}$$

$$-\frac{15}{4} + \frac{13}{4} = -\frac{2}{4} = \boxed{-\frac{1}{2}}$$

$$**25) \frac{1}{8} \left[(-6-4) + (3+11) \div -\frac{1}{3} \right]$$

**26) Over the last 2,000 years, Earth's population has doubled approximately five times. Use exponential notation to write an expression that indicates doubling five times.

**27) Evaluate if

$$m = 4, n = -\frac{3}{2} \text{ and } p = \frac{2}{3}$$

$$mn - np + m^2$$

$$25) \frac{1}{8} \left[-10 + 14 \div -\frac{1}{3} \right]$$

$$\frac{1}{8} \left(-10 + \frac{14}{1} \div -\frac{1}{3} \right)$$

$$\frac{1}{8} \left(-10 + \frac{14}{1} \cdot \frac{-3}{1} \right)$$

$$\frac{1}{8} \left(-10 + -\frac{42}{1} \right)$$

$$\frac{1}{8} (-52) = \frac{1}{8} \cdot \frac{-52}{1} = \frac{-13}{2} = \boxed{-6\frac{1}{2}}$$

$$26) \begin{matrix} 2 \\ \uparrow \\ 2^5 \end{matrix}$$

doubling 5 times

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 =$$

$$27) mn - np + m^2$$

$$(4) \left(-\frac{3}{2} \right) - \left(-\frac{3}{2} \cdot \frac{2}{3} \right) + 4^2$$

$$\left(\frac{4^2 \cdot -3}{1 \cdot 2} \right) - \left(-\frac{3}{2} \cdot \frac{2}{3} \right) + 16$$

$$-6 - (-1) + 16$$

$$-6 + 1 + 16$$

$$-5 + 16 = \boxed{11}$$

28) Mr. Vaughn travels over Thanksgiving for 4 hours to go 280 miles. How fast was he going? (show the formula)

$$28) D = RT$$

$$R = \frac{D}{T}$$

$$R = \frac{280}{4}$$

$$R = 70 \frac{\text{miles}}{\text{hr}}$$

29) Every year you and your family drive to your cousin's house 253 miles away. The trip usually takes five and a half hours. Find the average speed that you travel. (show the formula)

$$29) R = \frac{D}{T}$$

$$R = \frac{253}{5.5}$$

$$R = 46 \frac{\text{miles}}{\text{hr}}$$

**30) Tom formed a sequence of numbers using the equation $2x + 1 = \underline{\quad}$ as shown below.

Term 1: $2(1) + 1 = 3$

Term 2: $2(3) + 1 = 7$

Term 3: $2(7) + 1 = 15$

Term 4: $2(15) + 1 = \underline{\quad}$

What are the first 5 terms in Tom's sequence?

- A) 3, 7, 15, 31, 62
- B) 3, 7, 15, 31, 63
- C) 3, 7, 15, 30, 61
- D) 3, 7, 15, 30, 60

30) The #s in parentheses look like this as a pattern:

1, 3, 7, 15, (31)

so,

$$2(31) + 1 = 63$$

The first 5 terms would be: **B**

31) The first five terms of a pattern are shown below. The rule of the pattern is to multiply by 2 and then subtract 1.

4, 8, 7, 14, 13, ...

What should be the seventh term of this pattern?

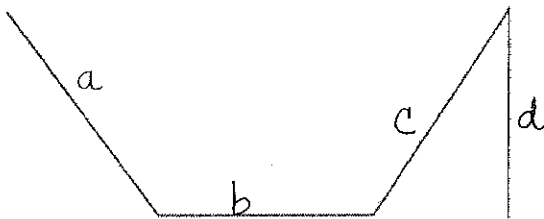
- A) 13
- B) 14
- C) 25
- D) 50

32) $x^0 =$

33) What sequence is this?

1, 1, 2, 3, 5, 8, 13, ...

34) Label the type of slope of each line segment below.



31) rule = $2x - 1$

4, 8, 7, 14, 13, 26, 25
↓ ↗ ↗ ↗ ↗
 $\times 2 - 1$ $\times 2 - 1$ $\times 2 - 1$ $\times 2 - 1$

C

32) $x^0 = 1$

33) Fibonacci Sequence

34)

a = negative

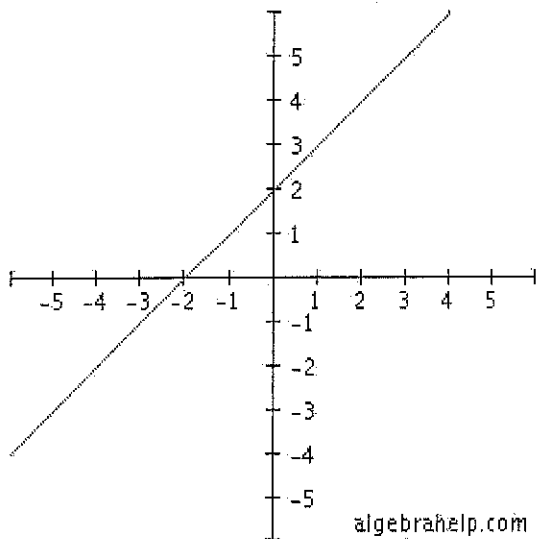
b = 0

c = positive

d = undefined

35) Which is most likely the slope of the line graphed below?

- a) 2
- b) $\frac{1}{2}$
- c) 1
- d) -2



35)

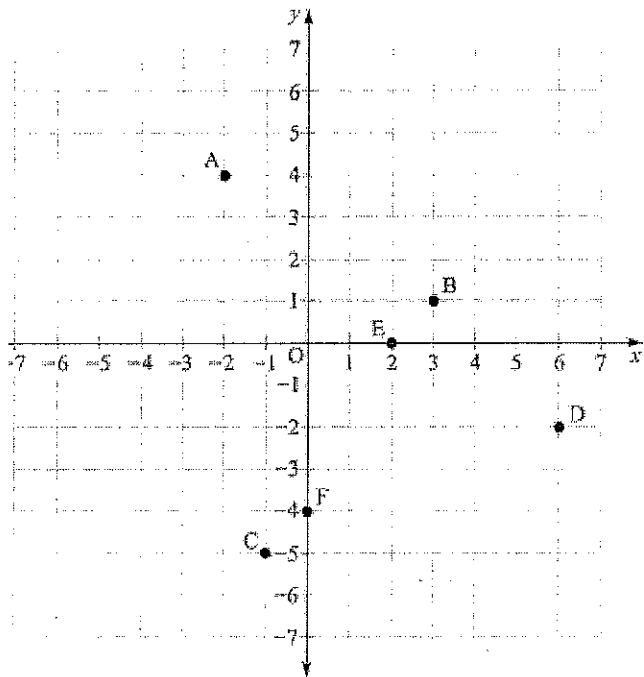
$$(-2, 0) (0, 2)$$

$$\frac{2}{2} = 1$$

C

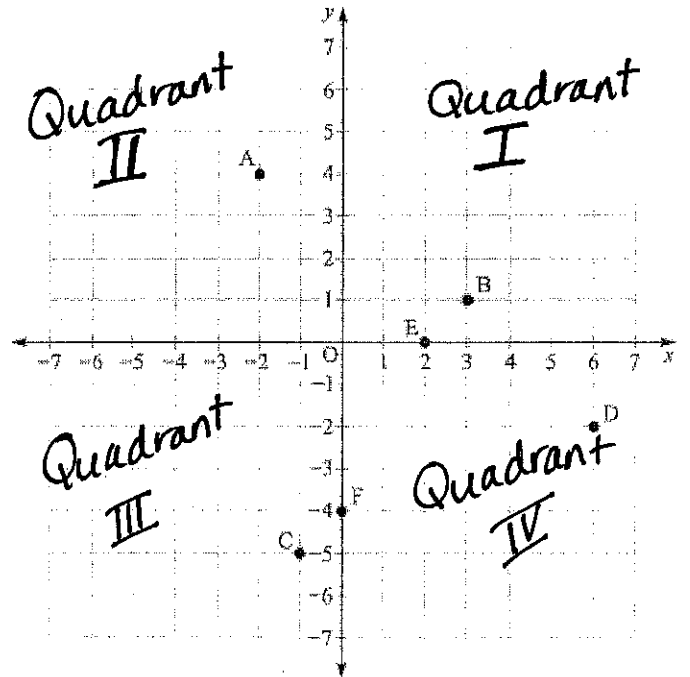
36) Tell the coordinates of each point. Then label the quadrants.

- A:
- B:
- C:
- D:
- E:
- F:



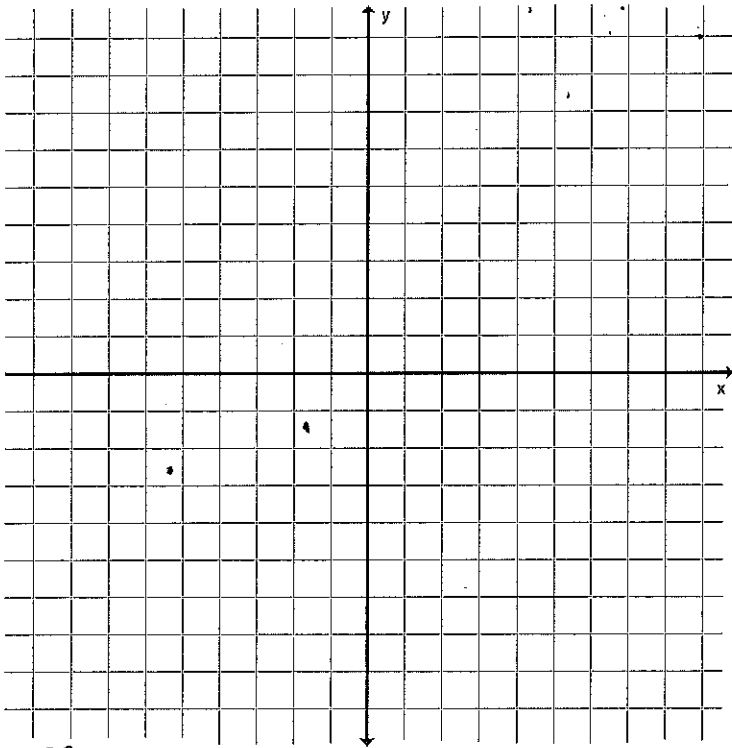
36)

- A: $(-2, 4)$
- B: $(3, 1)$
- C: $(-1, -5)$
- D: $(6, -2)$
- E: $(2, 0)$
- F: $(0, -4)$



37) Make a table of values and graph the results for the following equation. Then tell what type of slope the line has.

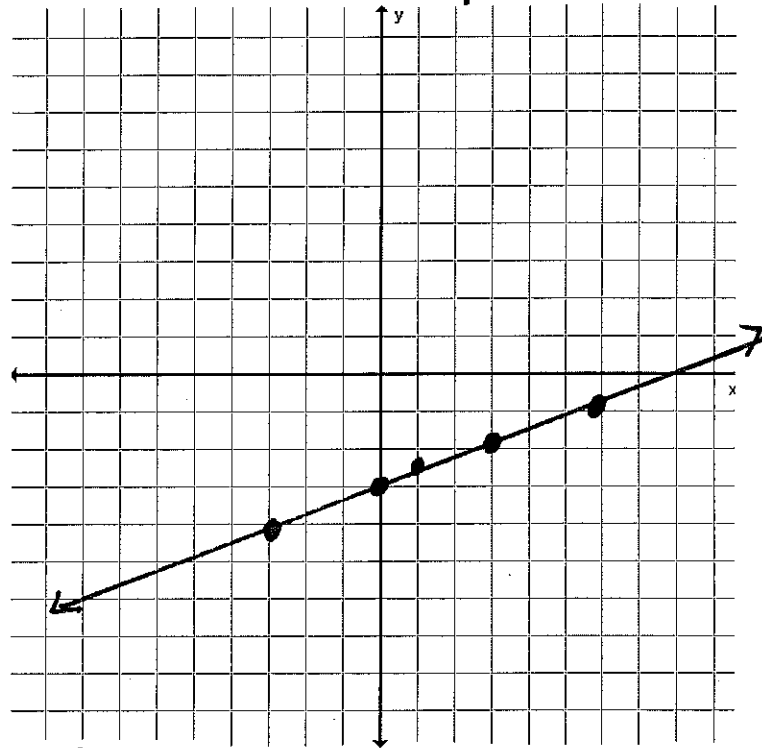
$$y = \frac{1}{3}x - 3$$



37)

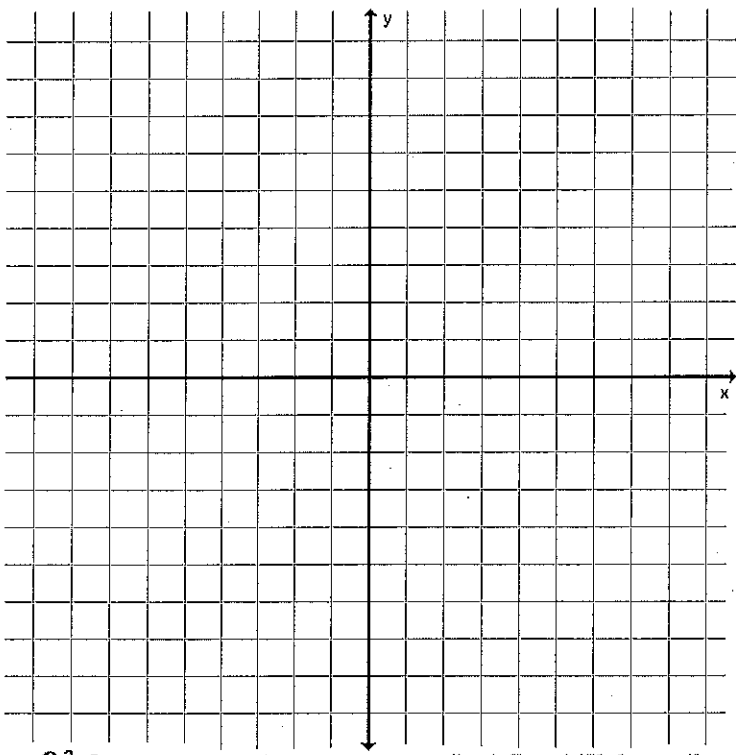
x	equation	y	(x,y)
0	$\frac{1}{3}(0) - 3 =$ $0 - 3 = -3$	-3	(0, -3)
1	$\frac{1}{3}(1) - 3 =$ $\frac{1}{3} - \frac{3}{1} = \frac{1-9}{3} = -\frac{8}{3}$	$-\frac{8}{3} =$ $-2\frac{2}{3}$	(1, $-2\frac{2}{3}$)
6	$\frac{1}{3}(6) - 3 =$ $\frac{1}{3} \cdot \frac{6^2}{1} = 2 - 3 =$	-1	(6, -1)
3	$(\frac{1}{3} \cdot \frac{3}{1}) = 1 - 3 =$ -2	-2	(3, -2)
-3	$\frac{1}{3} \cdot \frac{-3}{1} = -1 - 3 =$	-4	(-3, -4)

positive slope



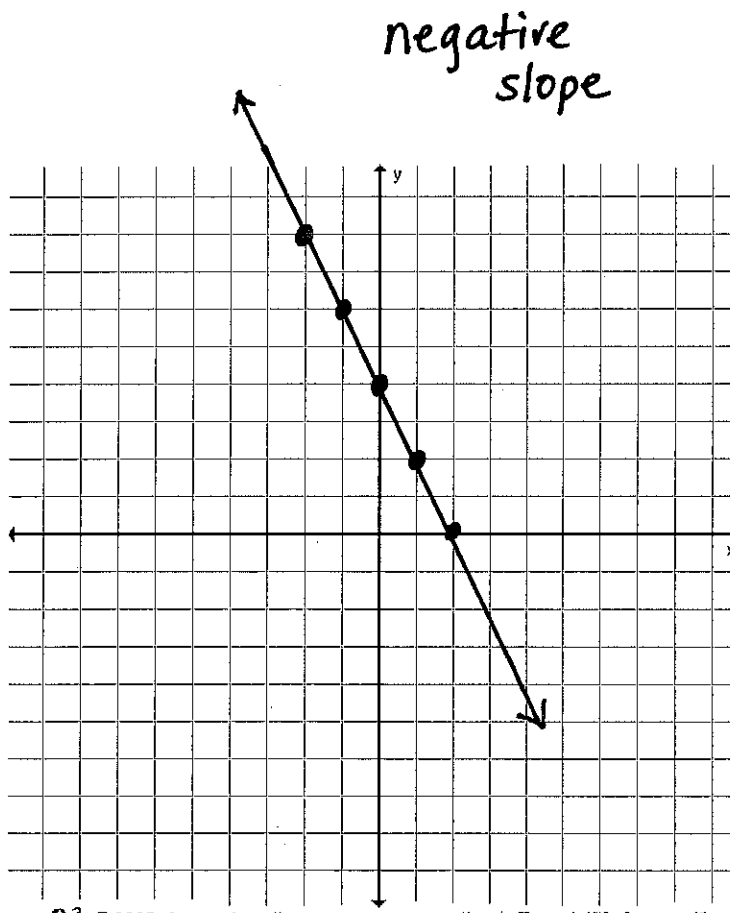
38) Make a table of values and graph the results for the following equation. Then tell what type of slope the line has.

$$-2x + 4 = y$$

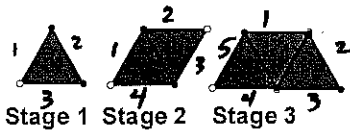


38) $-2x + 4 = y$

x	Equation	y	(x,y)
0	$(-2)(0) + 4 =$ $0 + 4 = 4$	4	(0,4)
-1	$(-2)(-1) + 4 =$ $2 + 4 = 6$	6	(-1,6)
1	$(-2)(1) + 4 =$ $-2 + 4 = 2$	2	(1,2)
2	$(-2)(2) + 4 =$ $-4 + 4 = 0$	0	(2,0)
-2	$(-2)(-2) + 4 =$ $4 + 4 = 8$	8	(-2,8)

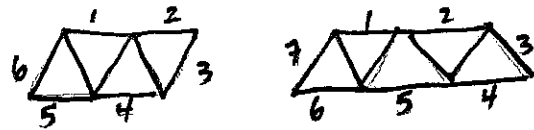


39.) Build a polygon train with triangles. Keep track of the stage and the perimeter. Put your stage and perimeter in a table and then create a graph to show the growth. Mark and label the axes.

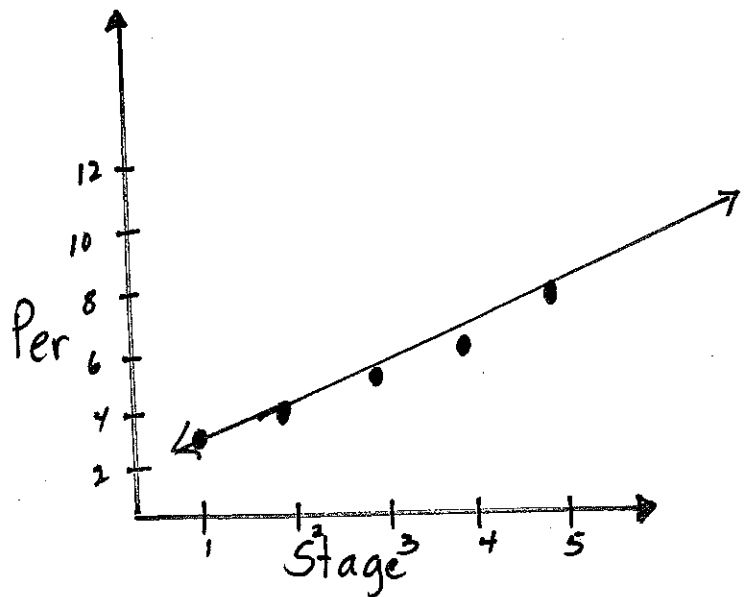
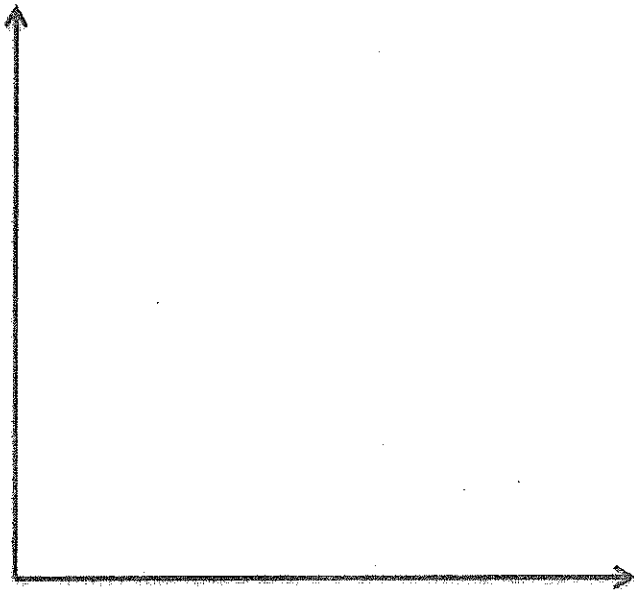


39)

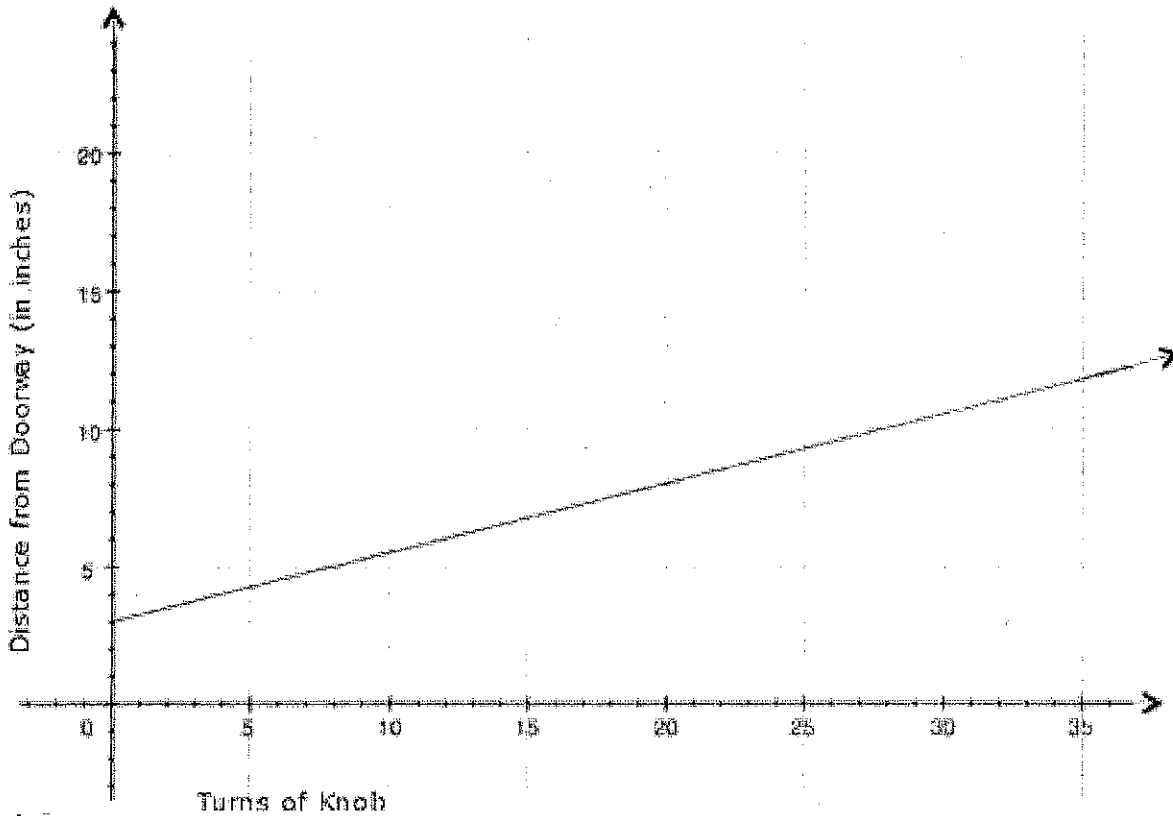
(x) Stage	(y) Per	(x,y)
1	3	(1,3)
2	4	(2,4)
3	5	(3,5)
4	6	(4,6)
5	7	(5,7)



Triangle Trains



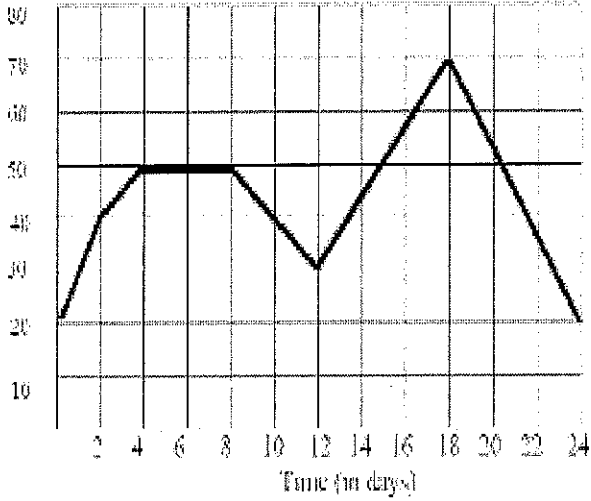
40) The graph below shows the distance that your wind-up car is from the doorway as a function of how many times its knob is turned:



40) How far from the doorway is the wind-up car once the knob has been turned 28 times?

40) 10 inches

41.) Write a story to describe the graph below. Then give the graph a name.

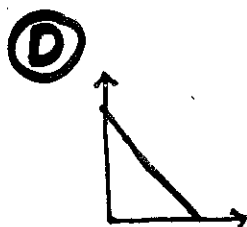
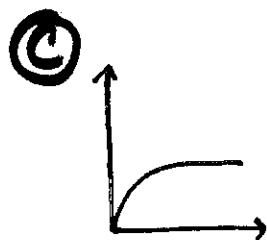
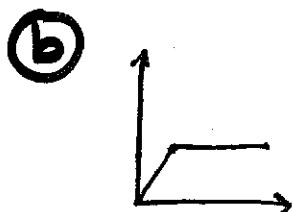
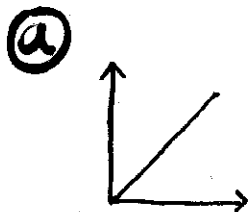


41)

Sally Skittle was saving her money in February to buy a new outfit to wear to the valentine's Day dance. She was so excited to go to the dance and hoped a new outfit would help Teddy Tootsie notice her. She started with \$20 that her grandmother had given her for Christmas. She babysat the whole next weekend and was able to put aside \$20 more dollars by Sunday. The next day she was cleaning her room and found \$10 under her bed. She was very busy for the next 4 days and did not save any additional money. And then her friend, Mary Mint, invited her to go skiing for a long weekend. Sally could not resist the offer, but ended up spending \$20 while on the ski trip. She then decided she had to really work hard babysitting so for the next 6 days she babysat every single day and was able to make \$40. That weekend she went shopping with her friends and found the perfect outfit for the dance which she bought for \$50!! She still had \$20 left and she was thinking about buying a new necklace to go with her new shirt.

Notice: This story includes all the different parts of the graph. The underlined parts in the story refer to the different lines in the graph.

42) Match the situation with the appropriate graph.



Situation 1: Your father is on a diet and he loses weight steadily for 2 months until he reaches his goal weight.

Situation 2: It has been sunny every day and the plant is growing nicely, but then you forget to water it and it does not grow at all for days.

Situation 3: It has been snowing 2 inches per hour for the past 12 hours!

Situation 4: Your grade in math is increasing steadily from the day you got your interim report but then you get busy with other things and your grade starts leveling off (not changing anymore).

42)

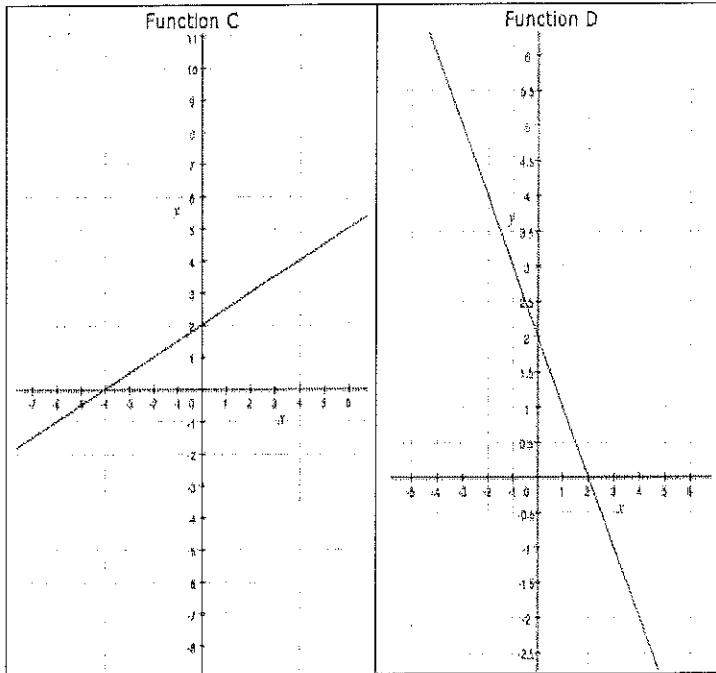
A → Situation 3

B → Situation 2

C → Situation 4

D → Situation 1

43)



43) What is the same about Function C and Function D?

44) What is different about Function C and Function D?

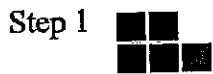
43)

They both cross the y axis at 2.

44) Function D has a negative slope and Function C has a positive slope.



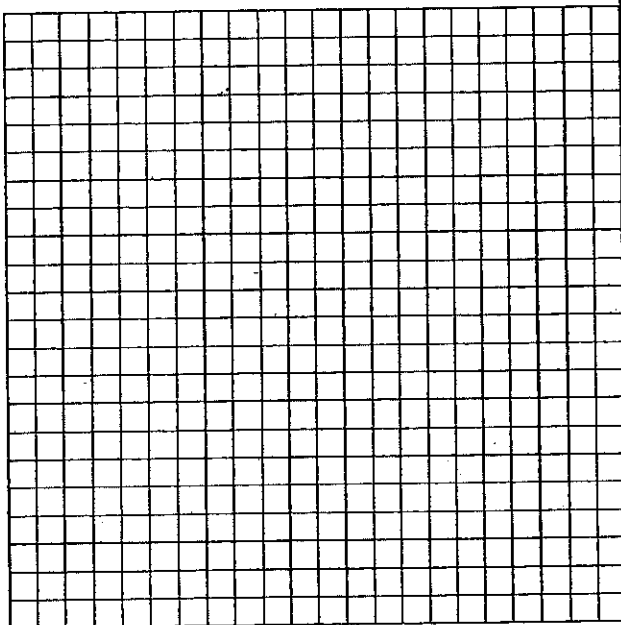
Each step in the pattern below is made up of small squares.



Use the information about the small squares to complete the following table.

Step #	Number of squares

Use a line graph. Make your own intervals.



Sketch Steps 4 and 5 below and describe the pattern:

Write a rule:





Each step in the pattern below is made up of small squares.

Step 1  5

Step 2  7.5

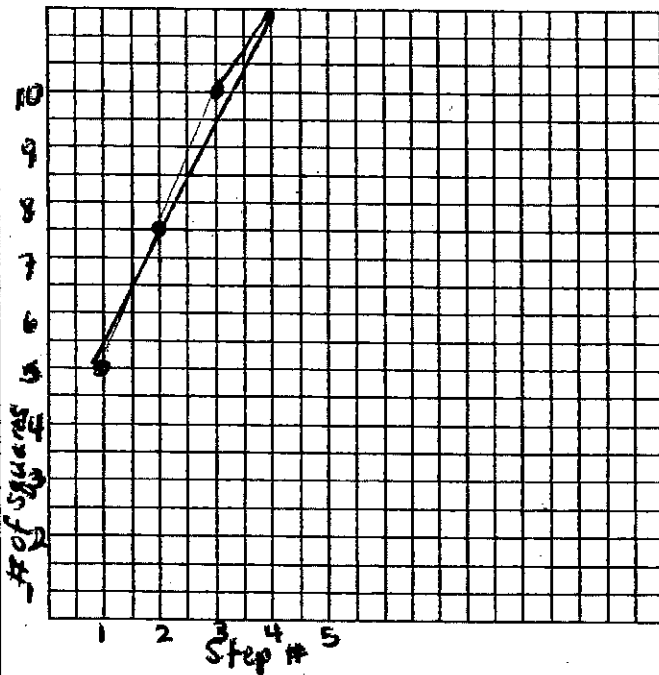
Step 3  10

Use the information about the small squares to complete the following table.

Step #	Number of squares
1	5
2	7.5
3	10
4	12.5
5	15

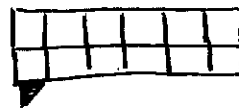
Squares in a Pattern

Use a line graph. Make your own intervals.

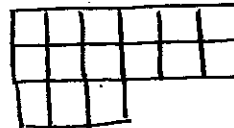


Sketch Steps 4 and 5 below and describe the pattern:

Step 4 = 12.5 squares



Step 5 = 15 squares



* Rule: $2.5x + 2.5$

