Name **Susie Student**

Grade:

____
12

Some HSA Toughies.... Are you up to the challenge?

1. Look at the pattern of small triangles in the table below.

Stage Number	1	2	3	4
Small Triangle Pattern	△	△	△	△
Number of Small Triangles	1	4	9	16

(handwritten: 25)
(handwritten under numbers: 3, 5, 7, 9)

If the pattern continues, how many small triangles will be in the design at Stage 10?

(handwritten) **25**

2. The state sales tax rate in Maryland is 5%. What is the total price of an item that costs x dollars?

(handwritten: .05x → tax + "x" (cost of item))

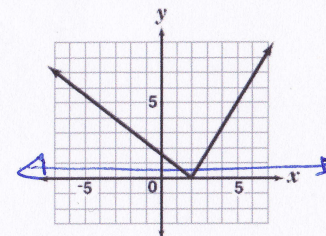a. 0.05x   b. x + 0.05   c. x + 0.05x *(circled)*   d. 0.5x

3. Look at the rectangle below.

$2x - 3$

$4 - x$
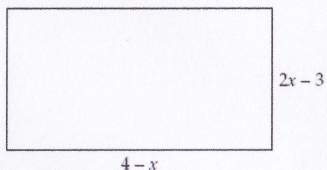
Which of these expressions represents the perimeter of the rectangle?

a. $2x - 3(4 - x)$
b. $(2x - 3)(4 - x)$
c. $(2x - 3) + (4 - x)$ *(circled)*
d. $2(2x - 3) + 2(4 - x)$

4. Look at the function that is graphed below.

Which of these describes the range of this function?

a. $y \geq 0$ c. all real numbers *(circled)*

b. $0 \leq y \leq 5$ d. all whole numbers

5. Look at the graph below.

What is the y value when x is 15?

(handwritten) **4**
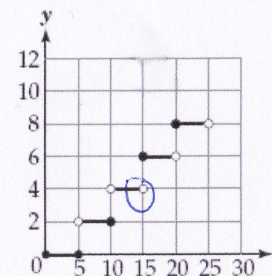
6. A car rental company has 2 rental plans. Plan A charges $49.00 per day. Plan B charges $25.00 per day, plus $0.10 per mile. How many miles must Teri drive in one day for Plan A to cost the same as Plan B?

(handwritten) **240**

(handwritten work:)
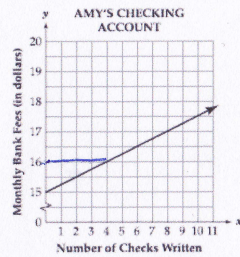X= Miles
49/day
25/day .10/mile
49 = 25 + .10X
-25 -25
24 = .10X
.10   .10
X = 240 miles

7. Amy has a checking acount at a bank. The graph below shows the relationship

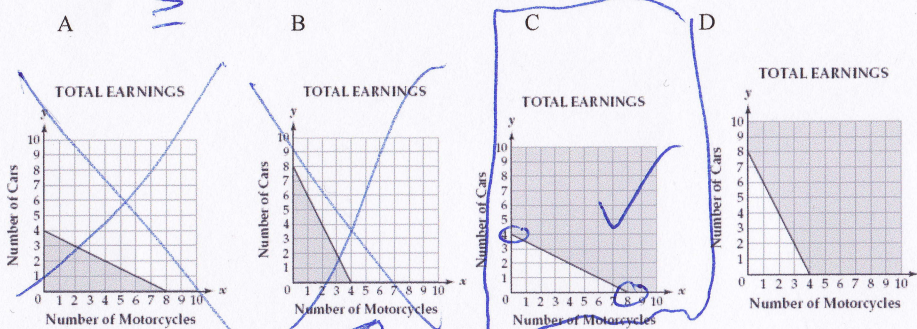between the number of checks she writes and her monthly bank fees.

If she writes 16 checks, what will be her monthly bank fee, in dollars?

[handwritten] 4

AMY'S CHECKING ACCOUNT — Monthly Bank Fees (in dollars) vs Number of Checks Written

[handwritten: 6C   3M]

8. Patrick washed cars and motorcycles. He charges $6 per car and $3 per motorcycle. He earns more than $24 a week. Which of these graphs best models this situation?

[handwritten: ≥]

A   B   C   D

TOTAL EARNINGS graphs (Number of Cars vs Number of Motorcycles)

[handwritten under A: less than]
[handwritten, C circled with checkmark]
[handwritten: 6C+3m ≥ 24]
[handwritten: if C=0 → 3m ≥ 24 (m ≥ 8)]
[handwritten: if m=0 → 6C ≤ 24 (C ≤ 4)]

9. The box-and-whisker plot below shows student scores on a physical fitness test.

[box-and-whisker plot with scale 50 60 70 80 90 100]
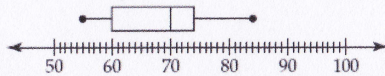
Students receive an award for scores at or above the upper quartile. What is the lowest score a student can get to receive an award?

a. 60 *[circled]*   b. 70   c. 74   d. 84

10. In a restaurant, two groups placed the orders shown in the table below.

ORDERS TAKEN

	Number of Small Lunch Plates	Number of Large Lunch Plates	Total Price
Group A Order	4 *X*	+ 1 *Y*	= $22.50
Group B Order	2 *X*	+ 3 *Y*	= $27.50

Based on this information, what is the price, in dollars, of a large lunch plate?

[handwritten] $4

[handwritten]
$$4x + y = 22.50$$
$$2x + 3y = 27.50$$

11. A store sells T-shirts. The matrices below show the number of T-shirts in the store November 1 and December 1.

T-SHIRTS IN THE STORE

Number of T-shirts on November 1st

	S	M	L	XL
White	100	150	170	200
Grey	150	160	220	240

[handwritten: 250 310 390 440]

Number of T-shirts on December 1st

	S	M	L	XL
White	40	110	150	140
Grey	100	120	130	150

[handwritten: 140 230 280 290]

If the store did not add any additional T-shirts between November 1 and December 1, what size T-shirt sold the least?

a. S   c. L
b. M *[circled]*   d. XL

*[handwritten:
S: 250 - 140 = 110
M: 310 - 230 = 80 least
L: 390 - 280 = 110
XL: 440 - 290 = 150]*

12. Alex advertised that 25 percent of the cars that she sold were red. Which of these could be used to simulate the number of red cars that Alexis sold?

a.   Toss a fair coin once.
b.   Spin a spinner with 4 equally likely-sized sections.
c.   Draw a crad from a deck of cards numbered 1 through 25. *[c circled]*
d.   Use a random number generator to generate the digits 1 through 10

[handwritten: D 1/4]