Accelerated Coordinate Algebra Name_____



# Spring 2016--Benchmark 1-- Study Guide

**(MCC9-12.N.Q.1) Choose the best answer.**

1) The new Corvette can go from 0 to 60 miles per hour in 3.4 seconds. This equates to 1320 feet in 11 seconds. Find the rate in miles per hour.

$\frac{ft}{sec}$ $\frac{1320}{11} = 120$ ft/sec $\times 3600$ (sec in hr) $= \frac{432000}{5280}$ (ft in mile) $= 81.8$

**(MCC9-12.A.CED.2, MCC9-12.A.REI.5) Solve the word problem.**

2) The senior classes at High School A and High School B planned separate trips to the county fair. The senior class at High School A rented and filled 12 vans and 4 buses with 312 students. High School B rented and filled 6 vans and 5 buses with 300 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

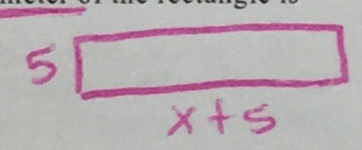
$12v + 4(48) = 312$
$12v + 192 = 312$
$12v = 120$ $v = 10$

$12v + 4b = 312$
$-2(6v + 5b = 300)$

$12v + 4b = 312$
$-12v - 10b = -600$
$-6b = -288$
$b = 48$

**(MCC9-12.A.CED.1) Choose the best answer.**

3) The length of a rectangle is $x + 5$ *inches* and the width is 5 *inches*. The perimeter of the rectangle is greater than 100 square inches. Which inequality can be used to find $x$?




A) $5 + (x+5) + 5 + (x+5) < 100$ B) $5 + x + 5 + 5 + x + 5 \geq 100$
C) $5 + (x+5) + 5 + (x+5) > 100$ D) $5 + x + 5 + 5 + x + 5 \leq 100$

**(MCC9-12.F.IF.2) Choose the best answer.**

4) To rent a boat at Lanier Lanier Islands you must pay $160 rental fee, plus $32.50 per hour. What equation below would give you the total amount you would have to pay?

A) $c(x)=160x$ B) $c(x)=192.50x$
C) $c(x)=160x + 32.50$ D) $c(x)=32.50x + 160$

**(MCC9-12.A.CED.2)**

5) Which equation describes the line that contains (1,5) and has a slope of 2?

A) $y=2x + 9$ B) $y=2x - 9$
C) $y=2x + 3$ D) $y=2x - 3$

plug in and find the one that makes a true statement

**(MCC9-12.F.IF.2)**

6) Which is the dependent variable in the following situation?
A decorator charges $ 40 for an intial consulation and then $80 per hour.

A) The number of hours B) The colors used in the decorating
C) The consulation fee D) Cost of using the decorator

cost depends on initial consultation & cost per hour

**(MCC9-12.A.CED.1) Choose the best answer.**

7) A parking lot holds 42 cars. There are 26 cars in the lot already. Which inequality can be solved to show the numbers of cars $c$ that can still park in the lot?

A) $26 + c < 42$ B) $26 + 42 \leq c$
C) $26 + 42 < c$ D) $26 + c \leq 42$

**(MCC9-12.A.CED.2, MCC9-12.A.REI.5) Solve the word problem.**

8) The school that Julia goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 8 adult tickets and 13 student tickets for a total of $115. The school took in $82 on the second day by selling 4 adult tickets and 10 student tickets. What is the price each of one adult ticket and one student ticket?

$8a + 13s = 115$
$4a + 10s = 82$

**(MCC9-12.A.CED.1)**

9) The fuel for a chain saw is a mix of oil and gasoline. The ratio of ounces of oil to gallons of gasoline is 7:19. There are 38 gallons of gasoline. How many ounces of oil are there?

A) 20 ounces B) 103.1 ounces
C) 3.5 ounces D) 14 ounces

oil $\frac{7}{19} = \frac{x}{38}$
gas

**(MCC9-12.F.IF.2) Choose the best answer.**

10) A decorator charges $ 40 for an intial consulation and then $80 per hour. Which function below gives the total amount you would be charged?

A) $c(x)= 40x + 80$ B) The function cannot be determined from the given information.
C) $c(x)= 40 + 80x$ D) $c(x)= 120x$

**(MCC9-12.A.CED.1)**

11) An architect built a scale model of a shopping mall. On the model, a circular fountain is 20 inches tall and 22.5 inches in diameter. The actual fountain is to be 8 feet tall. What will be the diameter of the fountain?

tall $\frac{20}{22.5} = \frac{8}{x}$
diameter

**(MCC9-12.F.IF.1)**

12) Which relation is NOT a function?

A) (-5, 26), (5, 36), (10, 16), (15, 6)
B) (0, 0), (1, 1), (6, 6),(12,12)
C) (6, 2), (-1, 2), (-3, 2), (-1, 5)
D) (6, 2), (2, 6), (3, 9), (4, 8)

X-values cannot repeat to be a function

**(MCC9-12.N.Q.1) Choose the best answer.**

13) There are 60 books on a shelf, some fiction and some nonfiction. The number of fiction books, $x$, is 6 more than twice the number of nonfiction, $y$. Which system can be used to find how many of each type are on the shelf?

A) $x + 60 = y$
$x = 2(y + 6)$

B) $x - y = 60$
$x + y = 2y$

C) $x + y = 60$
$x = 2y + 6$

D) $x + 60 = y$
$x = 2y - 6$

$x + y = 60$

$x = 2y + 6$

**(MCC9-12.F.IF.2)**

14) Evaluate $f(x)=3x^2 - 4$ when $x = -2$.

Plug it in

15) Which is the independent variable in the following situation?
"To rent a boat at Lake Lanier Islands you must pay $160 rental fee, plus $32.50 per hour.t"

A) The cost per hour
B) The rental fee
C) The number of hours
D) The cost of renting a boat

**(MCC9-12.A.REI.6)**

16) Photocopier A can print 35 copies per minute. Photocopier B can copy 35 copies per minute. Copier B is started and makes 10 copies. Copier A is then started. If the copiers continue, will the number of copies from machine A ever be equal to the number of copies from machine B? Explain your answer.

A: $35x$

B: $35x + 10$

No - have the same slope/rate so they never intersect

**(MCC9-12.G.GPE.6, MCC9-12.G.GPE.7, MCC9-12.A.CED.2)Find the midpoint of the line segment with the given endpoints.**

17) $(8, 6), (-2, 4)$

$\left(\frac{x+x}{2}, \frac{y+y}{2}\right)$

**(MCC9-12.G.GPE.6, MCC9-12.G.GPE.7, MCC9-12.A.CED.2)Find the distance between each pair of points.**

18) $(0, 3), (-2, -2)$

$\sqrt{(x-x)^2+(y-y)^2}$



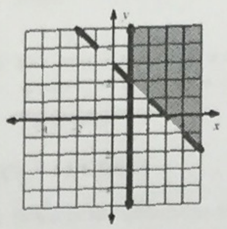

Line type
dotted > or <
solid ≥ or ≤

Shading
above > or ≥
below < or ≤

**Sketch the solution to each system of inequalities.**

19) $x \leq 1$
$y > -x + 3$

A)



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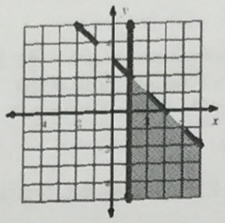

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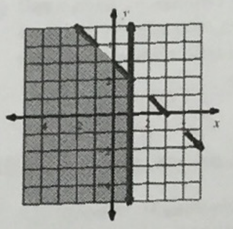

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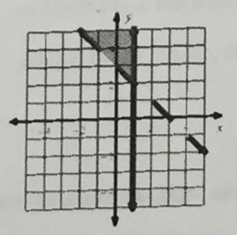
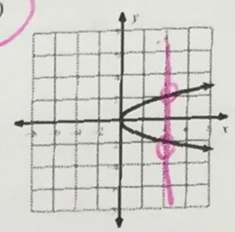


**(MCC9-12.F.IF.1)**

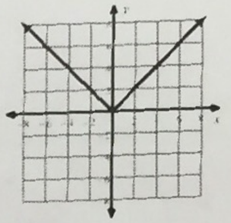
20) Which relation is NOT a function?

A)

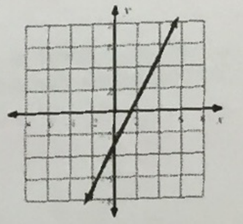


Vertical Line test

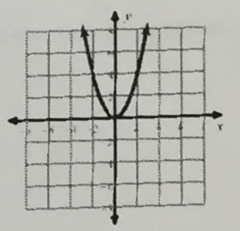
B)



C)



D)



**(MCC9-12.A.REI.6)**

21) The Strauss family is deciding between two lawn services. Green Lawn charges a $49 start up fee, plus $29 per month. Grass Team charges a $25 startup fee, plus $37 per month.

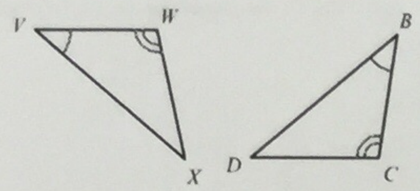
In how many months will the cost of both services be the same? Set them equal and solve

What will that cost be?

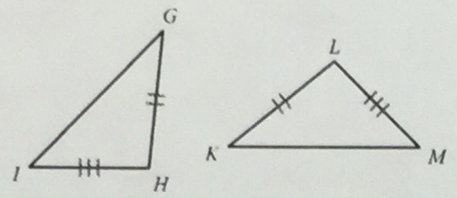
$49 + 29x = 25 + 37x$

**(MCC9-12.G.SRT.5, MCC9-12.A.CED.1)State what additional information is required in order to know that the triangles are congruent for the reason given.**

22) AAS




23) SSS




**(MCC9-12.F.BF.3)**

reflects if neg.

24) Describe the transformations for the graph of $y = -\frac{4}{3}x + 4$ from the parent graph $y = x$.

stretch
slope > 1

shrink
slope between 0 and 1

25) Describe the transformations for the graph of $y = \frac{1}{2}x$ from the parent graph $y = x$.

shift up if y-int is +, down if −

**(MCC9-12.A.REI.11)**

26) Tell whether the ordered pair ( -3, -1) is a solution to the system.

$y > -2$
$y < x + 4$

$-1 > -2$ plug it in
$-1 < 1$
yes

one solution you can find an answer

27) Which of the following systems of equations has exactly one solution?

A) $x + y = -6$
$-x - y = 6$

B) $-x - y = 4$
$x + y = 12$

C) $x + 3y = 15$
$2x - 3y = -6$

D) $x - y = 4$
$-x + y = 6$

No Solution: all variables cancel, diff. #'s left
Infinite: all variables cancel, #'s are same or cancel

**(MCC9-12. F.LE.2)**

28) During a certain period of time, about 70 northern sea otters had an annual growth rate of 18%. Find the number of sea otters in 4 years.

$70(1 + .18)^4$

29) Sam invests $50,000 at a rate of 3% compounded monthly. What is his investment worth in 6 years?

$50000\left(1 + \frac{.03}{12}\right)^{72}$

**(MCC9-12.F.LE.2)**

30) The half life of iodine-125 is 60 days.How much of a 450 gram sample would be left after 480 days? Round to the nearest hundredth.

$450(.5)^8$




**(MCC9-12.F.IF.7e, MCC9-12. F.BF.1a, MCC9-12.F.LE.1c)**

They are asking you to examine each part of the equation

31) The annual tuition at a community college since 2001 is modeled by the equation $C = 2000 \cdot 1.08^n$ where C is the tuition cost and n is the number of years since 2001. What was the tuition cost in 2001?

32) The annual tuition at a community college since 2001 is modeled by the equation $C = 2000 \cdot 1.08^n$ where C is the tuition cost and n is the number of years since 2001. What is the annual percentage of tuition increase?

.08 = 8%

**(MCC9-12.F.BF.2)**

33) What is the 10th term of the geometric sequence 2, -6, 18, ...?

$r = -3$ $\quad a_n = a_1 \cdot r^{n-1}$ $\quad$ so $a_n = 2 \cdot -3^{10-1}$

34) Three years ago, the tuition at a university was $3000. The following year the tuition was $3300 and last year the tuition was $3630. If the tuition has continued to grow in the same manner, what is the tuition this year?

$\frac{\text{new} - \text{orig}}{\text{orig}}$ gives rate of change $\rightarrow \frac{3300 - 3000}{3000} = .1$

$\hookrightarrow 3630(1 + .1)^1$

**(MCC9-12.F.BF.2, MCC9-12.F.LE.2)**

35) Gena starts an exercise program by running half a mile on Saturday morning. Each week, she increases the distance she runs by a quarter mile. Is this pattern arithmetic? If so, find the common difference and the first six terms of the sequence.

yes b/c it increases at same rate - just continue the pattern.

**(MCC9-12.S.ID.1, MCC9--12.S.ID.2, MCC9-12.S.ID.3)**

36) The amounts of snow(in inches) that fell during the last 8 winters in one city are given. Use the data to make a box and whisker plot.

25, 17, 14, 27, 20, 11, 29, 32

**Find the mean absolute deviation.**

37) 115, 112, 125, 116, 121, 113

① Find average
② Subtract average from each #
③ Add absolute values of those #'s then average them

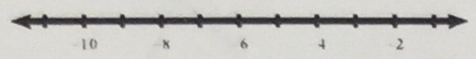
**(MCC9-12.F.BF.2, MCC9-12. F.LE.2)**

38) Find the 30th term of the arithmetic sequence 2.5, 8.5, 14.5, 20.5, .....

$a_n = a_1 + d(n-1)$ $\quad 2.5 + 6(30-1)$

**(MCC9-12.A.REI.3) Solve each inequality and graph its solution.**

39) $-2(5x - 7) \leq 84$




open circle > <
closed ≥ ≤
shade left < ≤
" " right > ≥

**(MCC9-12.F.IF.6) Find the slope of the equation.**

40) $x = -1$

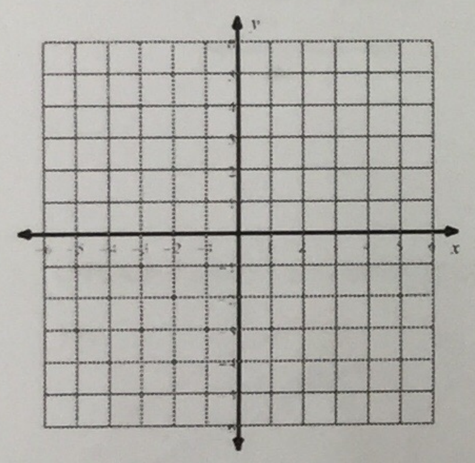
A) $\frac{5}{4}$ B) 0

C) $-\frac{5}{4}$ D) Undefined

41) $3x + 5y = 20$

**(MCC9-12.A.REI.12) Sketch the graph of each linear inequality.**

42) $x + 2y \leq 6$



**(MCC9-12.A.REI.3) Solve each proportion.**

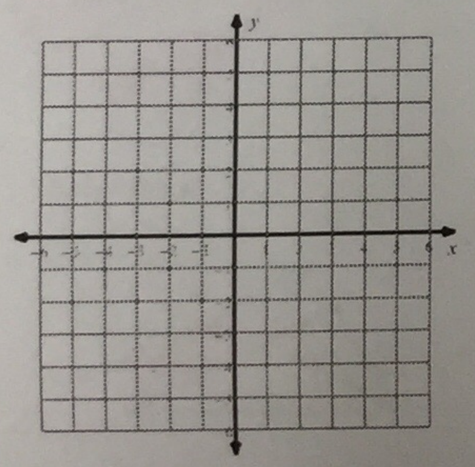
43) $\frac{10}{9} = \frac{n - 9}{2}$

A) {4.7} B) {5.3}

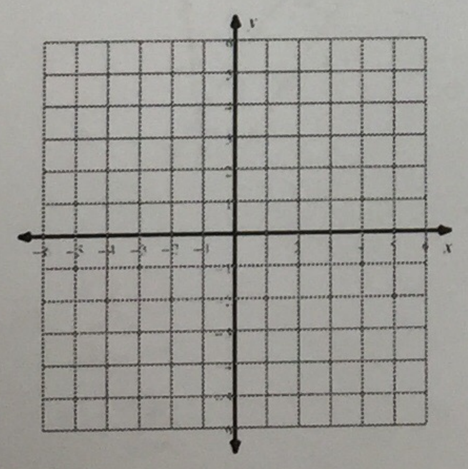
C) {10} D) {11.22}

**Sketch the graph of each line.**

44) $2x + y = 0$



45) $x = 2$



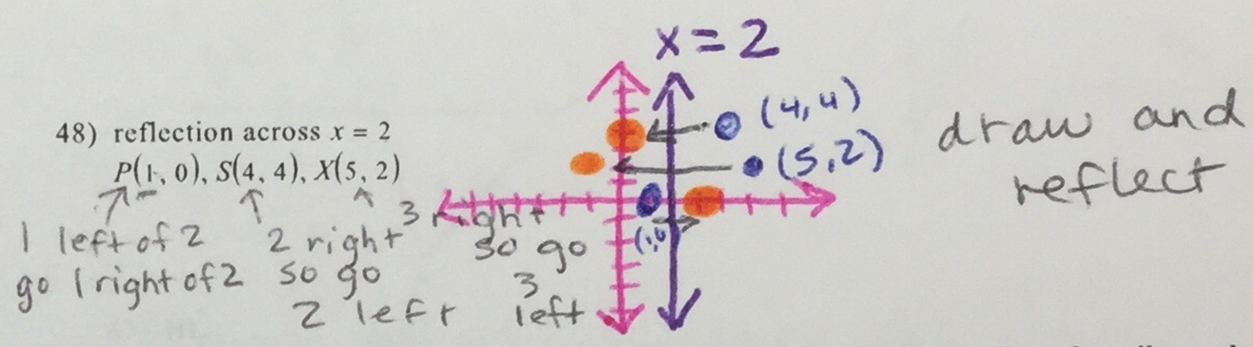
  

**(MCC9-12. G.CO.4, MCC9-12.G.CO.5, MCC9-12.G.CO.2)Find the coordinates of the vertices of each figure after the given transformation.**

46) translation: 1 unit left and 3 units down
$L(-2, 2), Z(3, 4), J(0, 1)$

47) rotation 90° counterclockwise about the origin
$B(-4, 0), D(-1, 4), C(1, 1), Q(-3, -3)$

48) reflection across $x = 2$
$P(1, 0), S(4, 4), X(5, 2)$



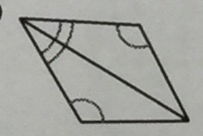

**(MCC9-12. G.CO.4, MCC9-12.G.CO.5, MCC9-12.G.CO.2) Write a rule to describe each transformation.**

49) $Z(2, 0), H(1, 4), J(2, 5), I(3, 5)$
to
$Z'(-2, 0), H'(-1, -4), J'(-2, -5), (-3, -5)$

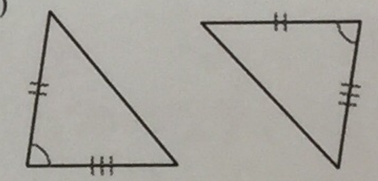
50) $E(-5, 2), I(-4, 4), D(-2, 4), N(-3, 2)$
to
$I'(4, 4), D'(2, 4), N'(3, 2), E'(5, 2)$

**(MCC9-12.G.SRT.5, MCC9-12.A.CED.1)State if the two triangles are congruent. If they are, state how you know.**

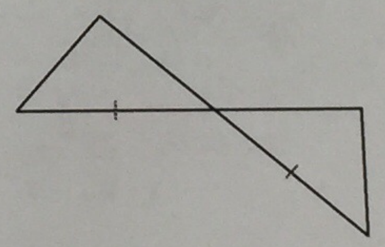
51)



52)



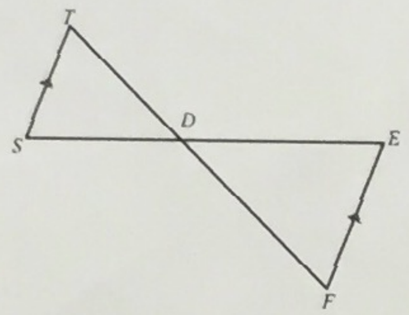
53)



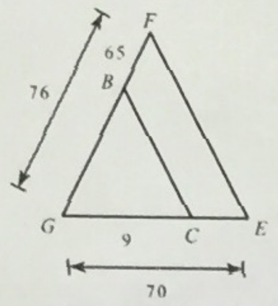
**(MCC9-12.G.SRT.3,4,5; MCC9-12. G.MG.1)State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.**

54)




$\triangle DEF \sim$ _____

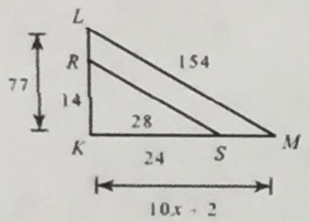
55)




$\triangle GFE \sim$ _____

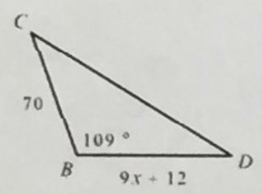
**(MCC9-12.G.SRT.5; MCC9-12.G.CO.9,12; MCC9-12.A.CED.1)Solve for $x$. The triangles in each pair are similar.**

56)

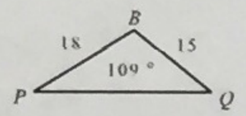



$\frac{14}{77} = \frac{24}{10x+2}$

57)

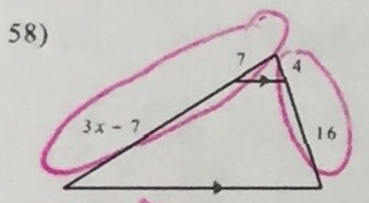



$\frac{70}{9x+12} = \frac{18}{15}$




**(MCC9-12.G.SRT.5; MCC9-12.G.CO.9,12; MCC9-12.A.CED.1)Solve for $x$.**

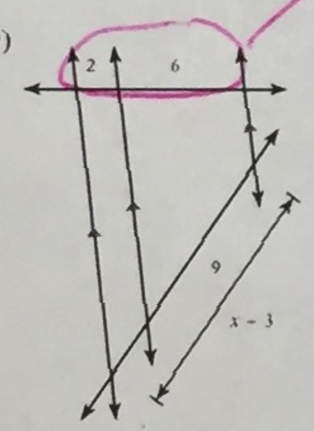
58)




Small $\triangle$ / large $\triangle$

$\frac{7}{4} = \frac{3x+14}{20}$

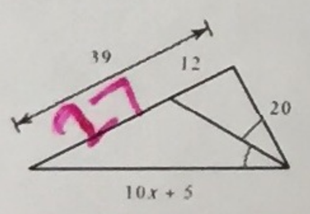
59)




$\frac{6}{9} = \frac{8}{x+3}$

**Solve for $x$.**

60)

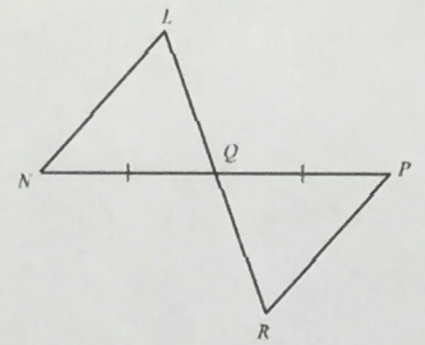



$\frac{10x+5}{27} = \frac{20}{12}$

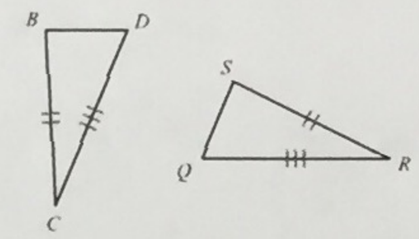
 

**State what additional information is required in order to know that the triangles are congruent for the reason given.**

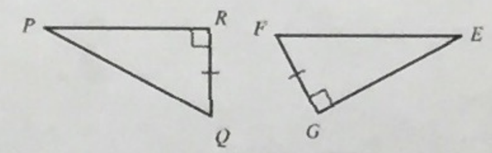
61) AAS



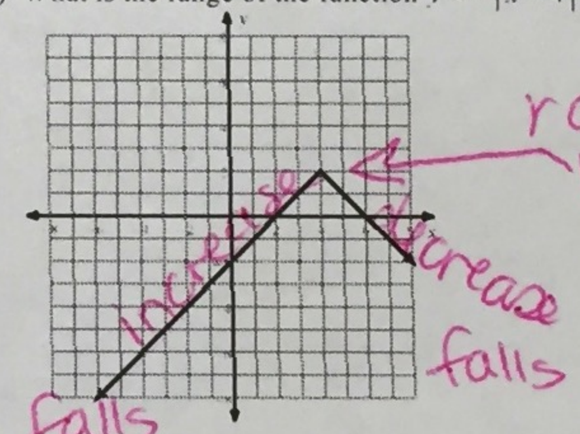

62) SAS




63) HL




64) What is the range of the function $y = -|x - 4| + 1$?




range is y-values
highest y, everything is below that

A) All real numbers B) $y \le 2$
C) $y \le -2$ D) $y \ge -2$

65) Describe the intervals of increase and decrease for the graph in question #64.

Increase: _____ Decrease: _____

Describe the end behavior.

_____ on left _____ on right