Name _____ Date _____

Math 8A - CC Algebra Period_____

Review for Common Core Algebra Midterm

1. Find three consecutive odd integers such that the sum of the second and twice the first is three more than twice the third.

2. Solve for B: $V = \frac{1}{3}Bh$

3. Izzy has twice as many nickels as pennies, and two less dimes as pennies. If, altogether, she has $1.48, how many coins of each type does she have?

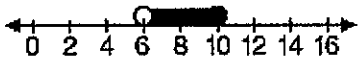
4. Solve for x: $\frac{1}{2} - \frac{5}{8}x \leq \frac{7}{8}x + \frac{7}{2}$

5. State if the sum of $4\sqrt{2}$ and $5\sqrt{6}$ is rational or irrational. Explain your answer.

6. Find the solutions for $5|x+4|-25=0$

7. The area formula of a circle is: $A=\pi r^2$. Solve for r in terms of A and π.

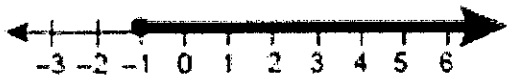
8. Write the following in interval notation:



9. Factor the expression $2x^3+2x^2-12x$ completely.

10. Simplify: $\dfrac{18y^3+12y^2-24y}{3y}$

11. State the interval notation which correctly represents the following graph?



12. Multiply the sum of $6x^2 - 2x + 5$ and $-3x^2 + 6x + 2$, by $\frac{1}{3}x^2$

13. Determine how many solutionsthe following equation has: $4(x+3)=2(2x+3)$

14. Factor: a) $6c^3d - 12c^2d^2 + 3cd$ b) $x^4 - 1$

15. Express the trinomial $x^2-4x-32$ as a product of two binomials.

16. Solve for x: a) $x^2 - 11x + 18 = 0$ b) $x^2 - 7x = 0$

17. Expand the binomial $(x-4)^2$ and represent your answer as a trinomial.

18. Solve for x in simplest radical form: $2x^2 - 36 = 0$

19. Use the following inequality to answer the questions below: $2x+4>6(x-4)$

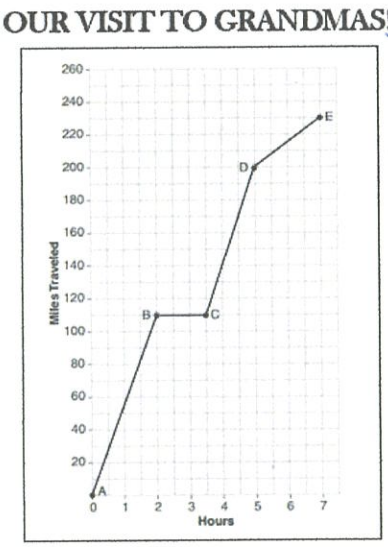
a. Solve the inequality

b. Graph the inequality on a number line

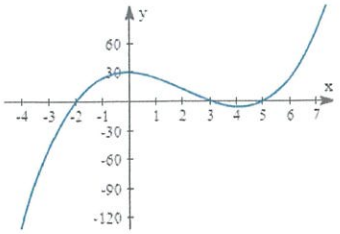
c. Represent the answer in interval notation

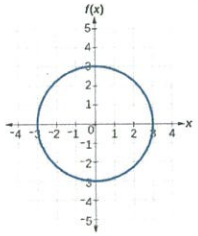
d. What is the largest possible integer value for x in the solution set?

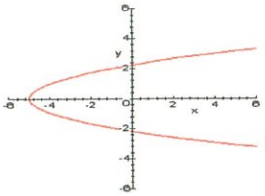
20a. Using the graph to the right, state what could have happened from point B to C and from point D to E.



20b. Which graph represents a function and why?



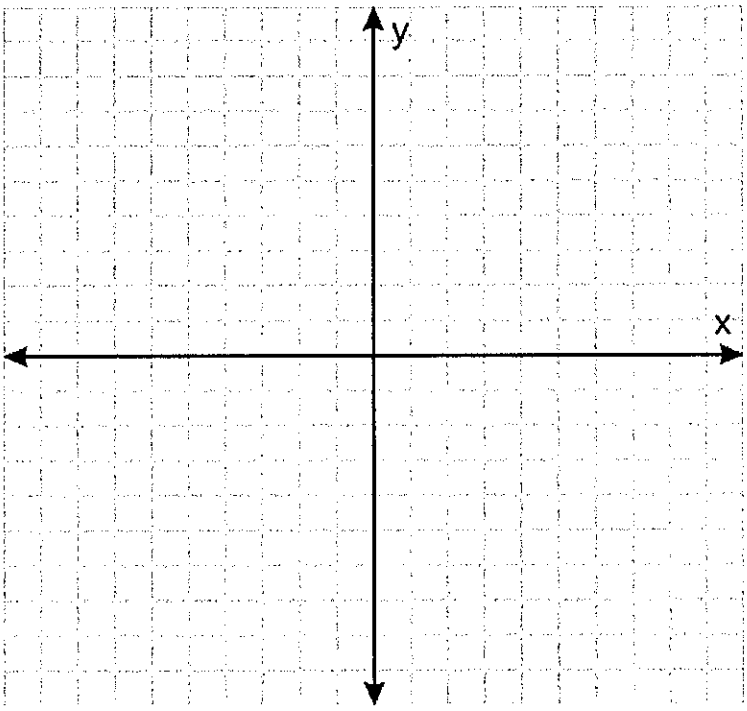




21. Graph the following system of linear equations. Then state the solution to the system.

$y = -\frac{2}{3}x + 2$

$y + 3 = \frac{1}{6}x$



Solution: _____

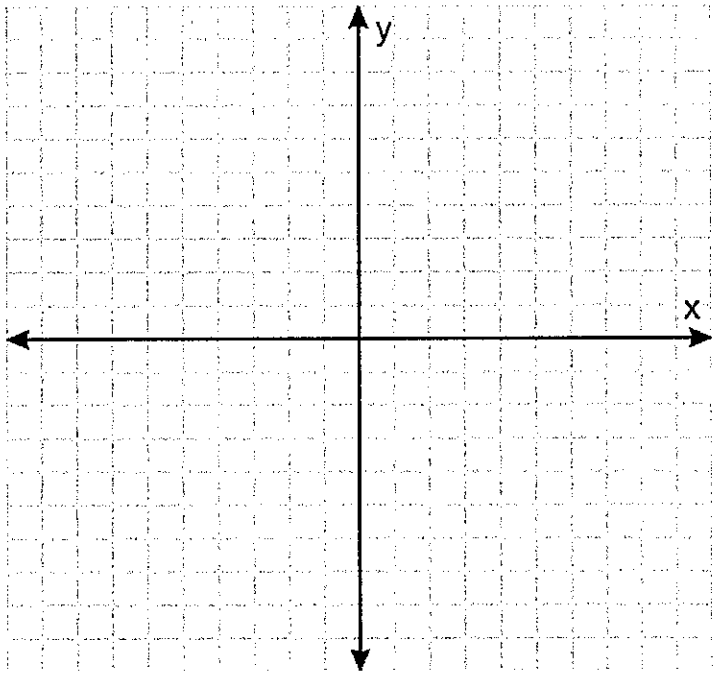
22. Solve the following system of inequalities. Label the solution set S.

$y < -2x - 1$

$y - 4x \leq 1$

Name a point that is a solution to one inequality but not the other.

Give a solution in the system and justify mathematically.



23a.

Determine the product of $(x+3)$ *and* $(x^2 - 2x + 5)$

23b.

Subtract $2x^2 - 8x + 4$ *from* $5x^2 + 3x - 1$

24. Use the following equation to show each property. $7(2x+3)-4=18x+6$

a) The Addition Property of Equality

b) The Subtraction Property of Equality

c) The Commutative Property

d) The Distributive Property

25. Factor the binomial $2x^2-50$ completely.

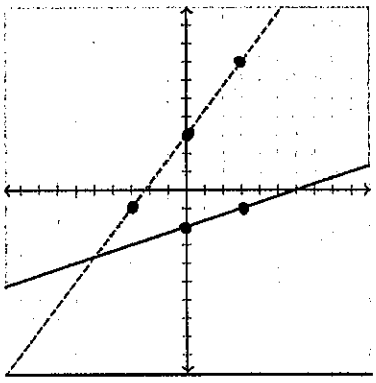
26. Answer the following questions that pertain to functions.

a) Hector's service club is raising money by wrapping presents in the mall. The function f(x) = 3x describes the amount of money, in dollars, the club will earn for wrapping x presents. They only have enough wrapping paper to wrap 1000 presents.

What type of numbers would you use to represent the domain, number of presents?

b) Given the function $h(x)=-4x+7$ defined on the domain $0 \le x \le 4$, what is the range?

27. Use the system of inequalities to the right.



a) Write the inequality for each.

b) Give a solution for the system. Justify mathematically.

28. Solve using the addition method:

$$5a+3b=17$$
$$4a-5b=21$$

29. The length of a rectangle is three less than twice the width. If the perimeter of the rectangle is 54cm, find the width of the rectangle.

30. Solve using the substitution method: $\begin{aligned} x+2y&=7 \\ x&=y-8 \end{aligned}$

31. Find four consecutive integers where the sum of the first and twice the third is two less than the sum of the second and the fourth.

32. Factor: $2n^2 + 3n - 9$

33. A baseball manager bought 4 bats and 9 balls for $76.50. On another day, she bought 3 bats and one dozen balls at the same prices and paid $81.00. How much did she pay for each bat and each ball?

34. What is the difference when $-59x^2 + 32xy + 45y$ is subtracted from $-22x^2 + 15xy - 37y$?

35. Factor the expression completely: $6x^3 - 20x^2$

36. Given: $-\frac{1}{3}x - \frac{2}{3} \geq 7x + 3$, which property is used below?

$$3\left(-\frac{1}{3}x - \frac{2}{3}\right) \geq 3(7x + 3)$$

37. A dealer sold 200 pairs of gloves. Some gloves were sold at $6 per pair and the remainders were sold at $11 per pair. Total receipts from the sale were $1,300. How many pairs of gloves did he sell for $6?

38. Jill is selling cookie boxes for The Girl Scouts. She wants to meet her goal of $750 or more. Each cookie box is sold for $5.50. What is the minimum number of cookie boxes Jill must sell to meet her goal?

39. Which number below is rational? Why is the number you chose a rational number?

$$\sqrt{\frac{4}{9}}, \sqrt{20}, \sqrt{121}$$

40. Solve for x: a) $y = 4(x - z)$ b) $8(2+bx)=12$

41. Solve for x:

a) $x-3(1-x)=47-x$

b) $\frac{3}{5}+\frac{x-8}{15}=\frac{7}{15}$

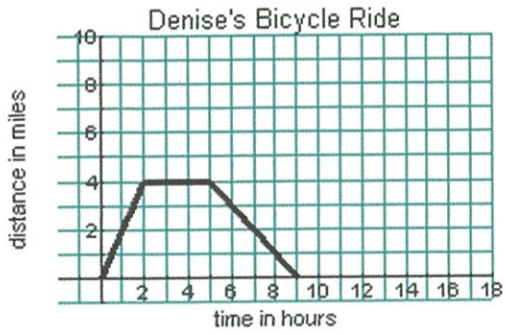
c) $0.07x+156.38=70+0.14x$

42. Henry will be renting a car. The rental company charges $37 per day and a flat processing fee of $30.

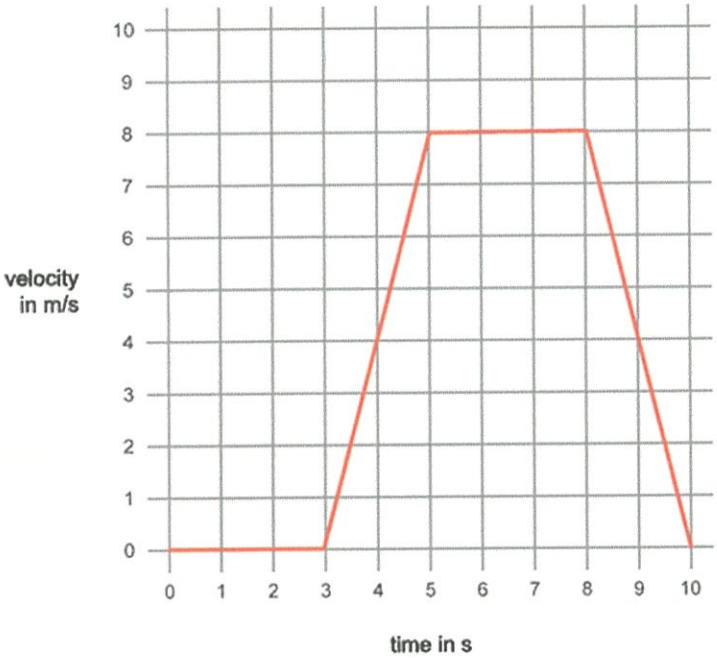
Write a function that represents the cost of the rental car, **c**, as a function of days, **d**.

Use the function to calculate the number of days Henry rented the car if he paid $252 in total.

43. What is the average rate of change from 0 hours to 2 hours?



44. What is the average rate of change from 3 seconds to 5 seconds?



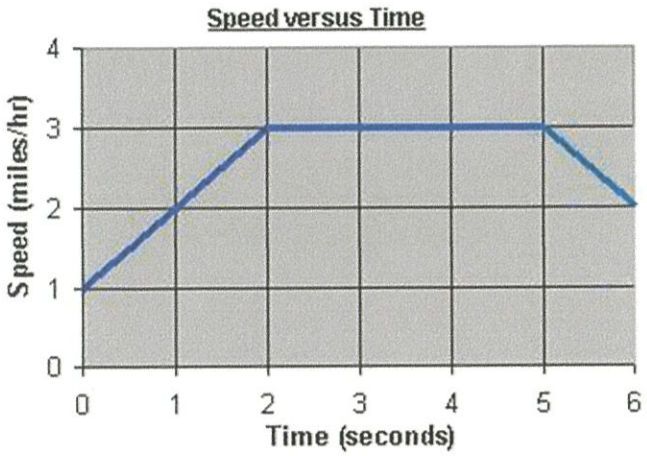
45. Solve for x:

$$\frac{x-4}{6}+\frac{1}{3}=\frac{2}{3}$$

46. Solve the equation for x in terms of b.

$2(bx + 6) = 17$

47. Describe what is happening between 2 & 5 seconds if the graph represents a cars speed during a 6 second interval.



a) The car was increasing in speed

b) The car stopped for three seconds

c) The car was decreasing in speed.

d) The car drove at a constant speed for 3 seconds.

48. Find the product for the following:

a) $(x - 3)^2$

b) $(x - 4)(x^2 - 6x + 7)$

49. Factor the following:

a) $x^2 - 2x - 80$

b) $25x^2 - 81$

c) $5x^2 - 45$

50. What is the equation of a line in point-slope form with a slope of 6 that passes through the point (-3,8)?

Name Key Date 18-19

8A Alg 1CC Period____

Review for Midterm

1. Find three consecutive odd integers such that the sum of the second and twice the first is three more than twice the third.

L

let
x = 1st COI
$x+2$ = 2nd COI
$x+4$ = 3rd COI

E

$x+2+2(x) = 3+2(x+4)$
$x+2+2x = 3+2x+8$
$3x+2 = 2x+11$
$-2x \quad -2x$
$x+2 = 11$
$-2 \quad -2$
$x = 9$
$x+2 = 11$
$x+4 = 13$

S

The three COI's are 9, 11, 13

C

$2(9) = 18$
$18+11 = 29$
$2(13) = 26$
$2C+3 = 29$

2. Solve for B: $V = \frac{1}{3}Bh$

*get rid of the fraction first

$(3)\ V = \frac{1}{3}Bh\ (3)$
$\frac{3V}{h} = \frac{Bh}{h}$
$B = \frac{3V}{h}$

3. Izzy has twice as many nickels as pennies, and two less dimes as pennies. If, altogether, she has $1.48, how many coins of each type does she have?

L

let
x = the # of pennies
$2x$ = the # of nickels
$x-2$ = the # of dimes
$.01(x)$ = the total value of pennies
$.05(2x)$ = the total value of nickels
$.10(x-2)$ = the total value of the dimes

E

$.01(x) + .05(2x) + .10(x-2) = 1.48$
$.01x + .10x + .10x - .2 = 1.48$
$.21x - .2 = 1.48$
$+.2 \quad +.2$
$\frac{.21x}{.21} = \frac{1.68}{.21}$
$x = 8$
$2x = 16$
$x-2 = 6$

S

Izzy has 8 pennies, 16 nickels + 6 dimes

C

$2(8) = 16$ ✓
$8-2 = 6$ ✓
$8(.01) = .08$
$16(.05) = .80$
$6(.10) = .60$
1.48 ✓

4. Solve for x: $\frac{1}{2} - \frac{5}{8}x \le \frac{7}{8}x + \frac{7}{2}$

$+\frac{5}{8}x \quad +\frac{5}{8}x$
$\frac{1}{2} \le \frac{3}{2}x + \frac{7}{2}$
$-\frac{7}{2} \quad -\frac{7}{2}$
$(\frac{2}{3})\ -3 \le \frac{3}{2}x\ (\frac{2}{3})$
$-2 \le x$

OR

$x \ge -2$

5. State if the sum of $4\sqrt{2}$ and $5\sqrt{6}$ is rational or irrational. Explain your answer.

$4\sqrt{2} + 5\sqrt{6} = 17.90430296\ldots$

It is irrational because it is a non-terminating and non-repeating decimal that can't be written as the ratio of two integers whose denominator is not zero.

6. Find the solutions for $5|x+4|-25=0$

$+25 \quad +25$

$\frac{5|x+4|}{5} = \frac{25}{5}$

$|x+4| = 5$

$|x+4| = 5$

$x+4=5 \quad | \quad x+4=-5$

$-4 \quad -4 \quad | \quad -4 \quad -4$

$x=1 \quad | \quad x=-9$

$\{-9, 1\}$

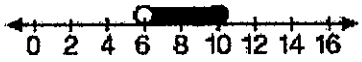
7. The area formula of a circle is: $A=\pi r^2$. Solve for r in terms of A and π.

$\frac{\pi}{\pi} \quad \frac{\pi}{\pi}$

$\sqrt{r^2} = \sqrt{\frac{A}{\pi}}$

$r = \sqrt{\frac{A}{\pi}}$

8. Write the following in interval notation:



$(6, 10]$

(or) $< a >$

[a] $\leq a \geq$

9. Factor the expression $2x^3+2x^2-12x$ completely.

GCF $2x(x^2 + x - 6)$

Tri $2x(x+3)(x-2)$

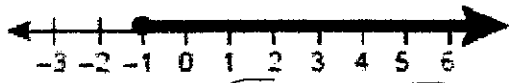
10. Simplify: $\frac{18y^3+12y^2-24y}{3y}$

$\frac{18y^3}{3y} + \frac{12y^2}{3y} - \frac{24y}{3y}$

$6y^2 + 4y - 8$

* Divide coefficients
* Subtract exponents

11. State the interval notation which correctly represents the following graph?



$[-1, \infty)$ ← $(-\infty$

12. Multiply the sum of $6x^2 - 2x + 5$ and $-3x^2 + 6x + 2$, by $\frac{1}{3}x^2$

$(6x^2-2x+5)+(-3x^2+6x+2)$ or $6x^2-2x+5 \; -3x^2+6x+2$

$3x^2+4x+7$

$6x^2 - 2x + 5$
$+ \; -3x^2 + 6x + 2$
$3x^2 + 4x + 7$

add exponents

$\frac{1}{3}x^2(3x^2+4x+7) = x^4 + \frac{4}{3}x^3 + \frac{7}{3}x^2$

13. Determine how many solutions the following equation has: $4(x+3) = 2(2x+3)$

$4x + 12 = 4x + 6$
$-4x \quad -4x$
$12 \neq 6$

NO/zero solutions

★ $12 = 12$ would be Infinitely many

★ $x = 7$ would be one solution

14. Factor: a) $6c^3d - 12c^2d^2 + 3cd$ b) $x^4 - 1$

GCF $3cd(2c^2 - 4cd + 1)$

conjugates
$(x^2-1)(x^2+1)$ DOPS

$(x+1)(x-1)(x^2+1)$ DOPS

15. Express the trinomial $x^2 - 4x - 32$ as a product of two binomials.

M A Ms

TI $(x-8)(x+4)$

16. Solve for x: a) $x^2 - 11x + 18 = 0$ b) $x^2 - 7x = 0$

TI $(x-9)(x-2)=0$

$x-9=0 \quad | \quad x-2=0$
$+9 \quad +9 \quad | \quad +2 \quad +2$
$x=9 \quad | \quad x=2$

$x(x-7)=0$ GCF

$x=0 \quad | \quad x-7=0$
$+7 \quad +7$
$x=7$

17. Expand the binomial $(x-4)^2$ and represent your answer as a trinomial.

$(x-4)(x-4)$

$x^2 - 4x - 4x + 16$

$x^2 - 8x + 16$

★ write twice, then double distribute

18. Solve for x in simplest radical form: $2x^2 - 36 = 0$

$+36 \quad +36$

$\frac{2x^2}{2} = \frac{36}{2}$

$\sqrt{x^2} = \sqrt{18}$

$\sqrt{9}\sqrt{2}$

$x = \pm 3\sqrt{2}$ ← 2 answers

19. Use the following inequality to answer the questions below: $2x + 4 > 6(x - 4)$

$2x + 4 > 6x - 24$

$-2x \quad -2x$

$4 > 4x - 24$

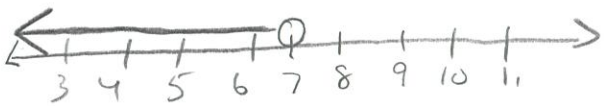
$+24 \quad +24$

$\frac{28}{4} > \frac{4x}{4}$

$7 > x$ or $x < 7$

a. Solve the inequality

b. Graph the inequality on a number line



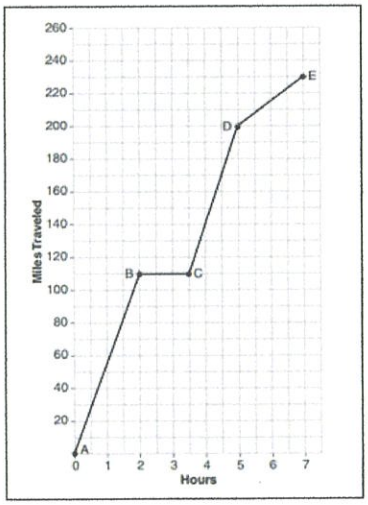
c. Represent the answer in interval notation

$(-\infty, 7)$

d. What is the largest possible integer value for x in the solution set?

6

20a. Using the graph to the right, state what could have happened from point B to C and from point D to E.

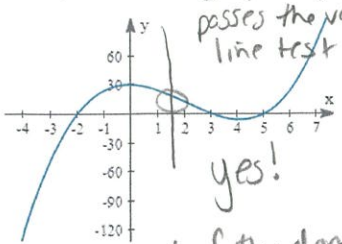


answers may vary

B → C: They have stopped at a rest stop for an hour and a half.

D → E: They drove at a slower pace. Maybe because there is more traffic / more cars on the road

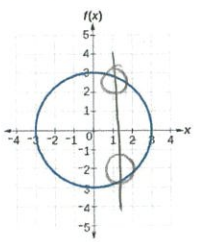
20b. Which graph represents a function and why?



passes the vertical line test

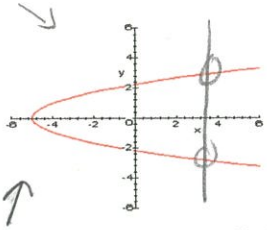
yes!

Each element of the domain corresponds to one and only one element of the range.



NO!

Fails the vertical line test



NO!

Each element of the domain DOES NOT correspond to one and only one element of the range.

21. Graph the following system of linear equations. Then state the solution to the system.

$y = -\frac{2}{3}x + 2$

m: $-\frac{2}{3}$ ↓ 2 →

B: 2

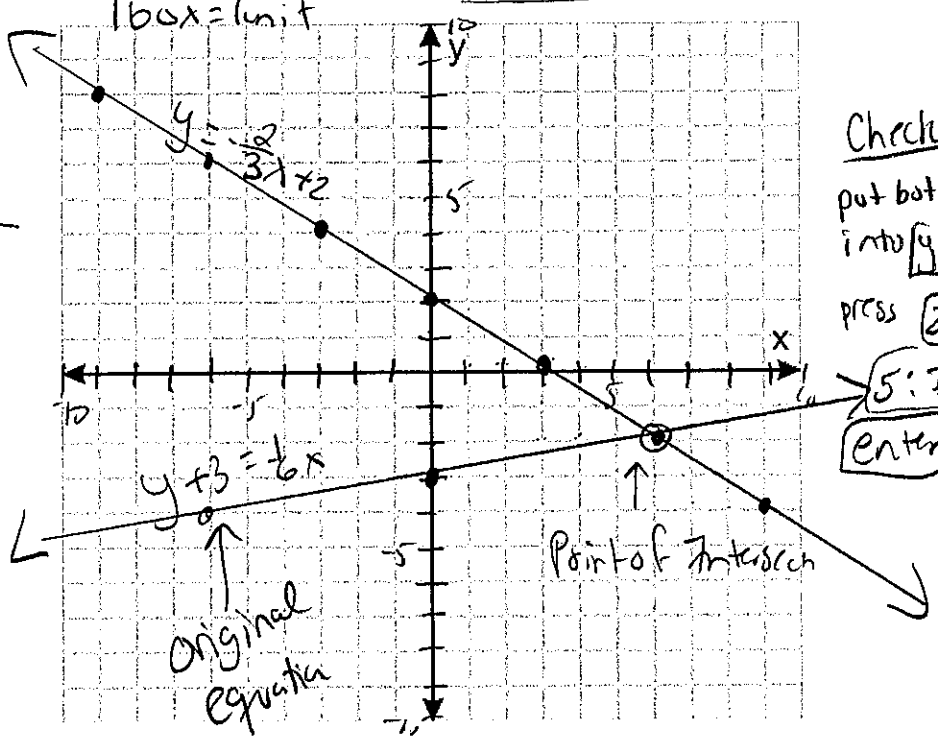
$y + 3 = \frac{1}{6}x$

$-3 \quad -3$

$y = \frac{1}{6}x - 3$

m: $\frac{1}{6}$ ↑ 1 →

B: −3



Check on calc:
put both equations into y= and then press 2nd trace
5: Intersect
enter 3 times

Solution: (6, −2)

22. Solve the following system of inequalities. Label the solution set S.

$y < -2x - 1$

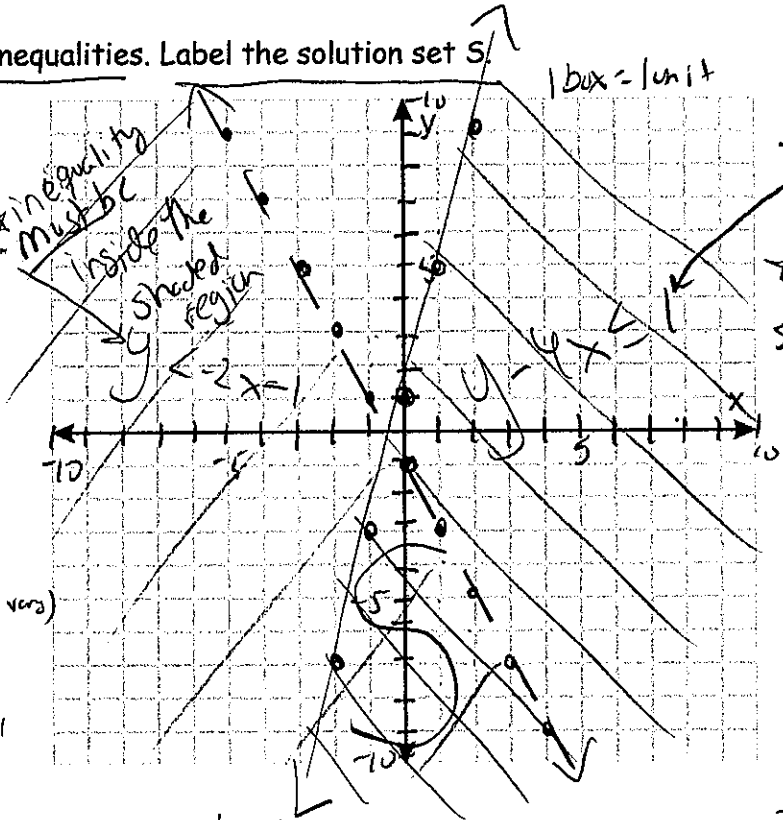
m: −2 ↓ 2 → B: −1 • Dotted • shade below

$y - 4x \leq 1$

$+4x \quad +4x$

$y \leq 4x + 1$

m: 4 ↑ 4 → B: 1 • Solid • shade below



Name a point that is a solution to one inequality but not the other.

(Answers will vary) (−3, 1)

Give a solution in the system and justify mathematically.

(Answers will vary)

(0, −5)

$y < -2x - 1$

$-5 < -2(0) - 1$

$-5 < 0 - 1$

$-5 < -1$ ✓

$y - 4x \leq 1$

$-5 - 4(0) \leq 1$

$-5 - 0 \leq 1$

$-5 \leq 1$ ✓

It is a solution b/c the point satisfies both inequalities.

23a.

Determine the product of $(x+3)$ *and* $(x^2 - 2x + 5)$

multiply ★ Add exponents

$(x+3)(x^2 - 2x + 5)$

$x^3 - 2x^2 + 5x + 3x^2 - 6x + 15$

$x^3 + x^2 - x + 15$

23b.

Subtract $2x^2 - 8x + 4$ *from* $5x^2 + 3x - 1$ ← on top/first

$(5x^2 + 3x - 1)$ need ( )!

$+(-2x^2 + 8x + 4)$ ← skip/switch change

$3x^2 + 11x - 5$

or

$(5x^2 + 3x - 1) - (2x^2 - 8x + 4)$

$5x^2 + 3x - 1 - 2x^2 + 8x - 4$

$3x^2 + 11x - 5$

24. Use the following equation to show each property. $7(2x+3)-4=18x+6$

a) The Addition Property of Equality

$7(2x+3)-4+4=18x+6+4$

$7(2x+3)=18x+10$

b) The Subtraction Property of Equality

$7(2x+3)-4-6=18x+6-6$

$7(2x+3)-10=18x$

c) The Commutative Property

$7(2x+3)-4=18x+6$

$7(2x+3)-4=6+18x$

d) The Distributive Property

$7(2x+3)-4=18x+6$

$14x+21-4=18x+6$

25. Factor the binomial $2x^2-50$ completely.

$2x^2-50$ ✱ Always look for GCF first!

GCF $2(x^2-25)$

DOPS $2(x+5)(x-5)$ ✓conjugates!

26. Answer the following questions that pertain to functions.

a) Hector's service club is raising money by wrapping presents in the mall. The function f(x) = 3x describes the amount of money, in dollars, the club will earn for wrapping x presents. They only have enough wrapping paper to wrap 1000 presents.

What type of numbers would you use to represent the domain, number of presents?

whole #'s B/C ya can't have partial of a present or a negative amount of presents → (can also be positive integers and 0) ✱

b) Given the function $h(x)=-4x+7$ defined on the domain $0\le x\le 4$, what is the range?

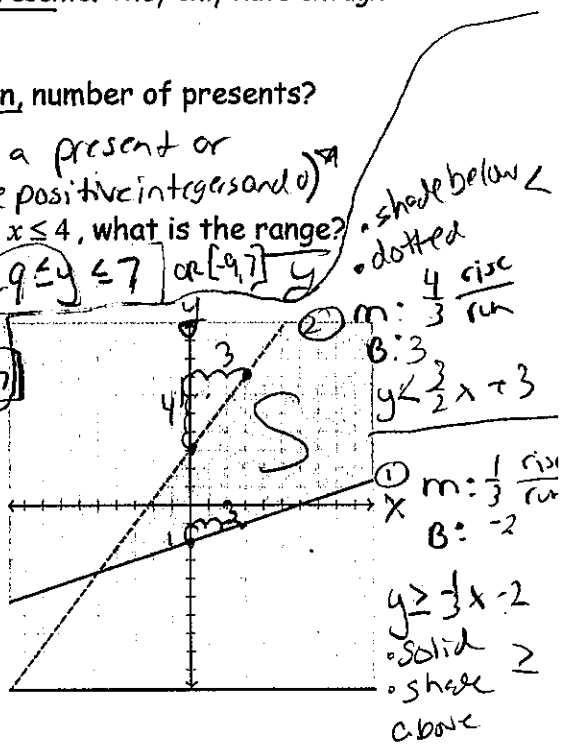
✱ put into y= + go to table! 2nd graph

x	h(x)
0	7
1	3
2	-1
3	-5
4	-9

$-9\le h(x)\le 7$

$-9\le y\le 7$ or $[-9,7]$ y

27. Use the system of inequalities to the right.



a) Write the inequality for each.

$y<\frac{4}{3}x+3$

$y\ge\frac{1}{3}x-2$

b) Give a solution for the system. Justify mathematically.

Answers will vary

(0,0) $y<\frac{4}{3}x+3$ $0<\frac{4}{3}(0)+3$ $0<0+3$ $0<3$ ✓

$y\ge\frac{1}{3}x-2$ $0\ge\frac{1}{3}(0)-2$ $0\ge0-2$ $0\ge-2$ ✓

A solution B/C the point satisfies both inequalities.

28. Solve using the addition method:

$5a+3b=17$

$4a-5b=21$

$4(5a+3b=17) \rightarrow 20a+12b=68$

$-5(4a-5b=21) \rightarrow \oplus\ -20a+25b=-105$

$37b=-37$

$\frac{37b}{37}=\frac{-37}{37}$

$b=-1$

$(4,-1)$

✱ use original ✱

$5a+3b=17$

$5a+3(-1)=17$

$5a-3=17$

$+3\ +3$

$\frac{5a}{5}=\frac{20}{5}$

$a=4$

chk #1

$5a+3b=17$

$5(4)+3(-1)=17$

$20-3=17$

$17=17$ ✓

chk #2

$4a-5b=21$

$4(4)-5(-1)=21$

$16+5=21$

$21=21$ ✓

29. The length of a rectangle is three less than twice the width. If the perimeter of the rectangle is 54cm, find the width of the rectangle.

L	E	S	C
let x = the width; $2x-3$ = the length	$2(x)+2(2x-3)=54$; $2x+4x-6=54$; $6x-6=54$; $+6\ +6$; $6x=60$; $x=10$; $2x-3=17$	The width of the rectangle is 10cm	$2(10)=20$; $20-3=17$; $2(10)=20$; $2(17)=34$; 54 ✓

OR – with systems:

L	E	S	C
let x = the length; y = the width	$x=2y-3$; $2x+2y=54$	$2x+2y=54$; $2(2y-3)+2y=54$; $4y-6+4y=54$; $6y-6=54$; $+6\ +6$; $6y=60$; $y=10$	$x=2y-3$; $x=2(10)-3$; $x=20-3$; $x=17$

30. Solve using the substitution method: $x+2y=7$, $x=y-8$

$x+2y=7$
$1(y-8)+2y=7$
$y-8+2y=7$
$3y-8=7$
$+8\ +8$
$3y=15$
$y=5$

$x=y-8$
$x=5-8$
$x=-3$

Chk #1
$x+2y=7$
$-3+2(5)=7$
$-3+10=7$
$7=7$ ✓

Chk #2
$x=y-8$
$-3=5-8$
$-3=-3$ ✓

31. Find four consecutive integers where the sum of the first and twice the third is two less than the sum of the second and the fourth.

L	E	S	C
let x = 1st CI; $x+1$ = 2nd CI; $x+2$ = 3rd CI; $x+3$ = 4th CI	$x+2(x+2)=(x+1+x+3)-2$; $x+2x+4=x+1+x+3-2$; $3x+4=2x+2$; $-2x\ -2x$; $x+4=2$; $-4\ -4$; $x=-2$; $x+1=-1$; $x+2=0$; $x+3=1$	The four CI's are $-2,-1,0+1$	$2(0)=0$; $-2+0=-2$; $-1+1=0$; $0-2=-2$ ✓

32. Factor: $2n^2+3n-9$

Tricky tri

$(2n+6)(2n-3)$ → simplify: $\frac{2n}{2}+\frac{6}{2}$

$(n+3)(2n-3)$

33. A baseball manager bought 4 bats and 9 balls for $76.50. On another day, she bought 3 bats and one dozen balls at the same prices and paid $81.00. How much did she pay for each bat and each ball?

C

let
x = the cost of 1 bat
y = the cost of 1 ball

E

$3(4x+9y = 76.50) \rightarrow +\ 12x+27y = 229.50$
$-4(3x+12y = 81) \rightarrow +\ -12x-48y = -324$

$-21y = -94.50$
$-21 \quad -21$
$y = 4.5$

$4x+9y = 76.50$
$4x+9(4.5) = 76.50$
$4x+40.50 = 76.50$
$-40.50 \quad -40.50$
$4x = 36$
$\frac{4x}{4} = \frac{36}{4}$
$x = 9$

S

she paid $9 for one bat + $4.50 for one ball

C

$4(9) = 36$
$9(4.5) = 40.5$
76.5
$3(9) = 27$
$12(4.5) = 54$
81

34. What is the difference when $-59x^2 + 32xy + 45y$ is subtracted from $-22x^2 + 15xy - 37y$?

$(-22x^2+15xy-37y)$
$+(+59x^2+32xy+45y)$
$37x^2-17xy-82y$

OR

$(-22x^2+15xy-37y) - 1(-59x^2+32xy+45y)$
$-22x^2+15xy-37y+59x^2-32xy-45y$
$37x^2-17xy-82y$

~~Don't~~ add exponents

35. Factor the expression completely: $6x^3 - 20x^2$

GCF $2x^2(3x-10)$

36. Given: $-\frac{1}{3}x-\frac{2}{3} \geq 7x+3$, which property is used below?

$3\left(-\frac{1}{3}x-\frac{2}{3}\right) \geq 3(7x+3)$

Multiplication Property of Inequality

37. A dealer sold 200 pairs of gloves. Some gloves were sold at $6 per pair and the remainders were sold at $11 per pair. Total receipts from the sale were $1,300. How many pairs of gloves did he sell for $6?

L	E	S	C
let x = the # of $6 gloves y = the # of $11 gloves	$6(x+y=200) \rightarrow +6x+6y=1200$ $-1(6x+11y=1300) \rightarrow -6x-11y=-1300$ $-5y=-100$ $-5 \quad -5$ $y=20$ $x+y=200$ $x+20=200$ $-20 \quad -20$ $x=180$	He sold 180 pairs of $6 gloves.	$180+20=200$ $6(180)=1080$ $11(20)=220$ $1300\checkmark$

38. Jill is selling cookie boxes for The Girl Scouts. She wants to meet her goal of $750 or more. Each cookie box is sold for $5.50. What is the minimum number of cookie boxes Jill must sell to meet her goal?

L	I	S	C
let x = # of cookie boxes Jill must sell	$\frac{5.50x}{5.50} \geq \frac{750}{5.50}$ $x \geq 136\frac{4}{11}$	Jill must sell a minimum of 137 boxes to reach her goal	$5.50(137)=753.50$ $753.50 \geq 750$ ✓ $5.50(100)=550$ $550 \not\geq 750$

39. Which number below is rational? Why is the number you chose a rational number?

$\sqrt{\frac{4}{9}}, \sqrt{20}, \sqrt{121}$

$\sqrt{\frac{4}{9}} = \frac{2}{3}$ (repeating decimal)

$\sqrt{20} = 4.472135955\ldots$

$\sqrt{121} = 11 = \frac{11}{1}$ (whole #)

$\sqrt{\frac{4}{9}}$ + $\sqrt{121}$ are both rational because they can both be expressed as the ratio of two integers whose denominator is not zero.

40. Solve for x: a) $y = 4(x - z)$

$y = 4x - 4z$

$+4z \quad +4z$

$\frac{y+4z}{4} = \frac{4x}{4}$

$x = \frac{y+4z}{4}$

$x = \frac{y+4z}{4}$ or $x = \frac{y}{4} + z$

b) $8(2+bx) = 12$

$16 + 8bx = 12$

$-16 \quad -16$

$\frac{8bx}{8b} = \frac{-4}{8b}$

$x = -\frac{1}{2b}$

41. Solve for x:

a)

$x - 3(1-x) = 47 - x$

$x - 3 + 3x = 47 - x$

$4x - 3 = 47 - x$

$+x \quad +x$

$5x - 3 = 47$

$+3 \quad +3$

$\frac{5x}{5} = \frac{50}{5}$

$x = 10$

b)

$\frac{3}{5} + \frac{x-8}{15} = \frac{7}{15}$

$-\frac{3}{5} \quad -\frac{3}{5}$

$\frac{x-8}{15} = \frac{-2}{15}$ OR $15\left(\frac{x-8}{15}\right) = \left(\frac{-2}{15}\right)15$

$15(x-8) = -30$

$15x - 120 = -30$

$+120 \quad +120$

$\frac{15x}{15} = \frac{90}{15}$

$x = 6$

$x - 8 = -2$

$+8 \quad +8$

$x = 6$

c)

$0.07x + 156.38 = 70 + 0.14x$

$-0.07x \qquad -0.07x$

$156.38 = 70 + 0.07x$

$-70 \quad -70$

$\frac{86.38}{0.07} = \frac{0.07x}{0.07}$

$x = 1234$

D C M S

42. Henry will be renting a car. The rental company charges $37 per day and a flat processing fee of $30. → b (y-int)

m: slope

Write a function that represents the cost of the rental car, c, as a function of days, d.

$y = mx + b$

$m = 37$

$b = 30$

$y = 37x + 30$

$C(d) = 37d + 30$

$y \quad x$

★ must use C and d

Use the function to calculate the number of days Henry rented the car if he paid $252 in total.

C(d) 5

$C(d) = 37d + 30$

$252 = 37d + 30$

$-30 \qquad -30$

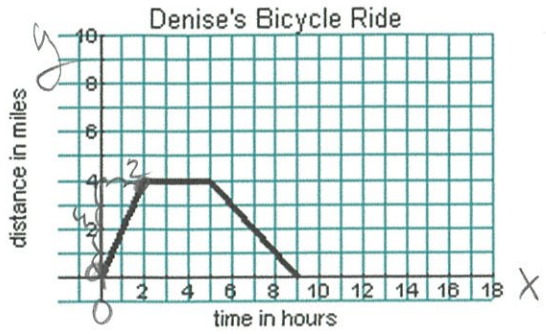
$\frac{222}{37} = \frac{37d}{37}$

$d = 6$

6 days

means slope $\frac{\Delta y}{\Delta x}$

43. What is the average rate of change from 0 hours to 2 hours?



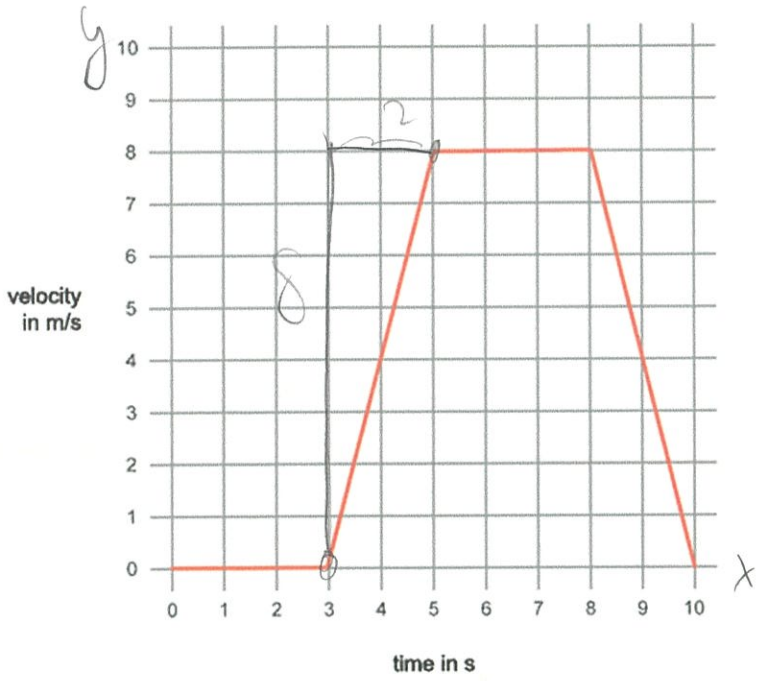
Slope $m = \frac{\text{rise}}{\text{run}}$

$m = \frac{4}{2}$

Slope = 2

mean slope $\frac{\Delta y}{\Delta x}$

44. What is the average rate of change from 3 seconds to 5 seconds?



Slope $m = \frac{\text{rise}}{\text{run}}$

$m = \frac{8}{2}$

Slope = 4

45. Solve for x:

$$\frac{x-4}{6} + \frac{1}{3} = \frac{2}{3}$$

$-\frac{1}{3}$ $-\frac{1}{3}$

$\frac{x-4}{6} = \frac{1}{3}$

or $6 \cdot \left(\frac{x-4}{6}\right) = \left(\frac{1}{3}\right) \cdot 6$

$3(x-4) = 6$

$3x - 12 = 6$

$+12 \quad +12$

$\frac{3x}{3} = \frac{18}{3}$

$x = 6$

$x - 4 = 2$

$+4 \quad +4$

$x = 6$

46. Solve the equation for x in terms of b.

$2(bx + 6) = 17$

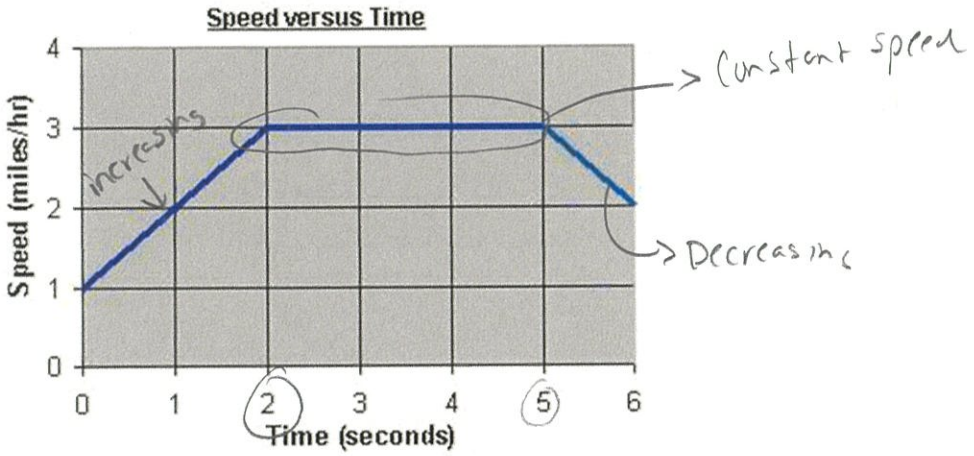
$2bx + 12 = 17$

$-12 \quad -12$

$\frac{2bx}{2b} = \frac{5}{2b}$

$x = \frac{5}{2b}$

47. Describe what is happening between 2 & 5 seconds if the graph represents a cars speed during a 6 second interval.



a) The car was increasing in speed (from 0 to 2 seconds)

b) The car stopped for three seconds → If it stopped, the speed would be 0 (only if it said Distance)

c) The car was decreasing in speed. ↓

d) The car drove at a constant speed for 3 seconds.

48. Find the product for the following:

a) $(x-3)^2$ * write twice, then double distribute

$(x-3)(x-3)$

$x^2-3x-3x+9$ ← combine like terms

x^2-6x+9

b) $(x-4)(x^2-6x+7)$ Triple distribute

$x^3-6x^2+7x-4x^2+24x-28$

$x^3-10x^2+31x-28$

* multiply the coefficients
* Add exponents
* Combine like terms

49. Factor the following:

a) $x^2-2x-80$ (m & n) Tri factor

$(x-10)(x+8)$

b) $25x^2-81$ Diffs * create conjugate

$(5x+9)(5x-9)$

c) $5x^2-45$

$5(x^2-9)$

$5(x+3)(x-3)$

Factor completely GCMF * Always do GCMF 1st DOPS

50. What is the equation of a line in point-slope form with a slope of 6 that passes through the point (-3,8)? (x_1, y_1) (m)

formula: $y-y_1=m(x-x_1)$

$y-8=6(x+3)$

*remember to change the signs of the x and y coordinates