Kuta Software - Infinite Pre-Algebra

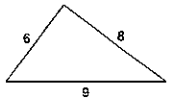
Name_____

The Pythagorean Theorem

Date_____ Period____

Do the following lengths form a right triangle?

1)



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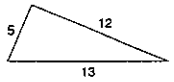

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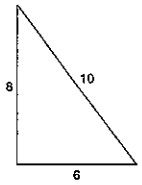

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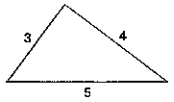
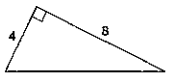


5) *a = 6.4, b = 12, c = 12.2*

6) *a = 2.1, b = 7.2, c = 7.5*

Find each missing length to the nearest tenth.

7)



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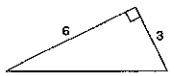

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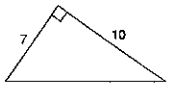

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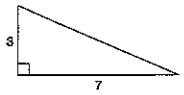

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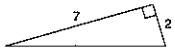

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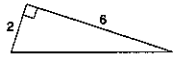

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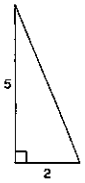

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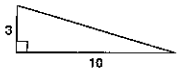

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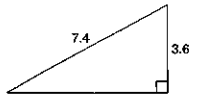

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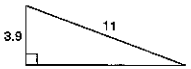

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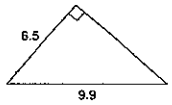

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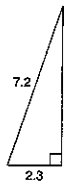

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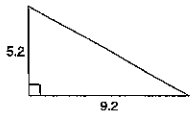

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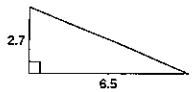

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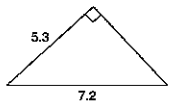

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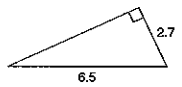


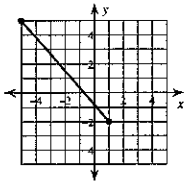
Kuta Software - Infinite Geometry Name_____

The Distance Formula

Date_____ Period____

Find the distance between each pair of points. Round your answer to the nearest tenth, if necessary.

1)



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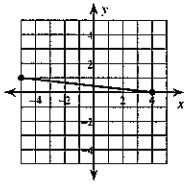

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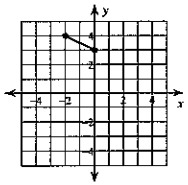

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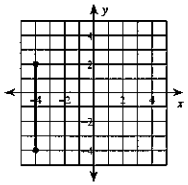

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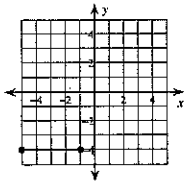

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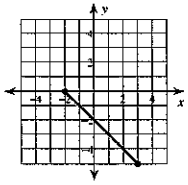


7) (–2, 3), (–7, –7)

8) (2, –9), (–1, 4)

9) (5, 9), (–7, –7)

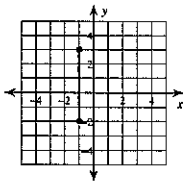
10) (8, 5), (–1, 3)

11) (–10, –7), (–8, 1)

12) (–6, –10), (–2, –10)

Find the distance between each pair of points.

13)



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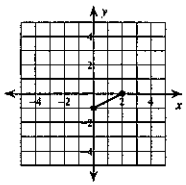

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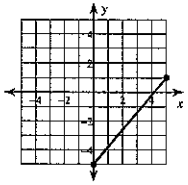

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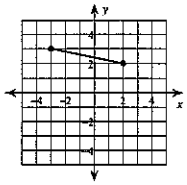

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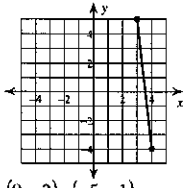

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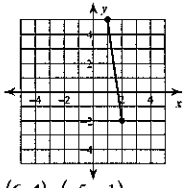


19) (0, –2), (–5, –1)

20) (6, 4), (–5, –1)

21) (3, 8), (9, 10)

22) (10, 1), (9, –4)

23) (–8, 10), (–6, 7)

24) (–5, 6), (8, –4)

Critical thinking questions:

25) Name a point that is $\sqrt{2}$ away from (–1, 5).

26) Name a point that is between 50 and 60 units away from (7, –2) and state the distance between the two points.

Name:

Class Period: Date:

Station Number & Objective	WORK/NOTES:
Station 1: Looking For Pythagorean - Distance **Objective:** I can use my knowledge of Pythagorean Theorem to find the distance between two points on a coordinate plan.	**Please attach the worksheet that is at Station 1 to your center work!!**
Station 2: Missing Side **Objective:** I can find the missing side of a right triangle using my knowledge of Pythagorean Theorem.	1. 2. 3. 4.

Station 3: Looking for Pythagorean Applications

Objective: I can use the Pythagorean theorem to determine if a triangle is a right triangle or not.

Side Lengths (units)	Do the side lengths satisfy $a^2 + b^2 = c^2$?	Is the triangle a right triangle?
3, 4, 5		
5, 12, 13		
5, 6, 10		
6, 8, 10		
4, 4, 4		
9, 12, 15		

1. Make an observation about the triangles whose side lengths satisfy the Pythagorean Theorem.

2. Make an observation about the triangles whose side lengths do NOT satisfy the Pythagorean Theorem.

3. Test your observations from question 1 and 2 with two of your own examples:

Station 4: Word Problems

Objective: I can use my knowledge of Pythagorean Theorem to find the missing measurements in real-world applications.

1.

2.

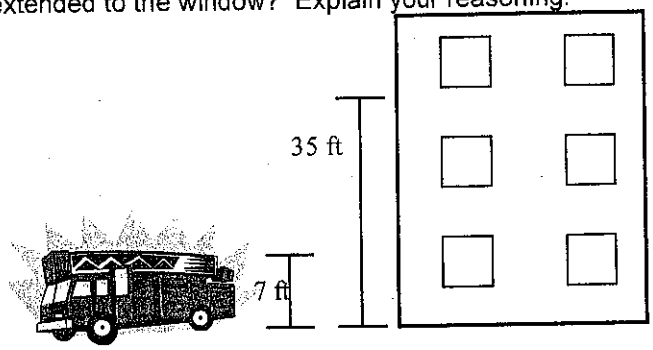
3.

4.

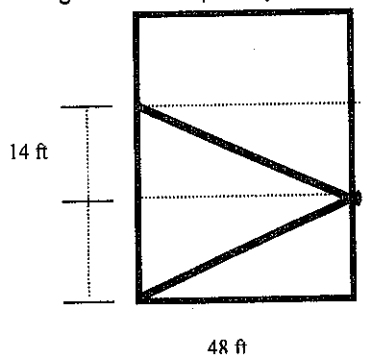
Fire in Pythagorville

1. A fire breaks out at the Pythagorville Math Museum. The fire department is called to the scene. Over the scanner, WABC hears of the fire and dispatches their helicopter to the scene for a live report. How much further must the Pythagorville Fire Department travel by road than the WABC helicopter travels by air? Explain your reasoning.

2. Once the PFD arrives at the scene, they discover the fire on the third floor of the museum. They calculate that the third floor window is forty feet from the base of the building. Using the hook and ladder fire engine they must extend the ladder to fight the fire. The ladder is anchored to the top of the truck at a height of seven feet and the truck is parked twenty-one feet from the base of the building. How long will their ladder be once fully extended to the window? Explain your reasoning.



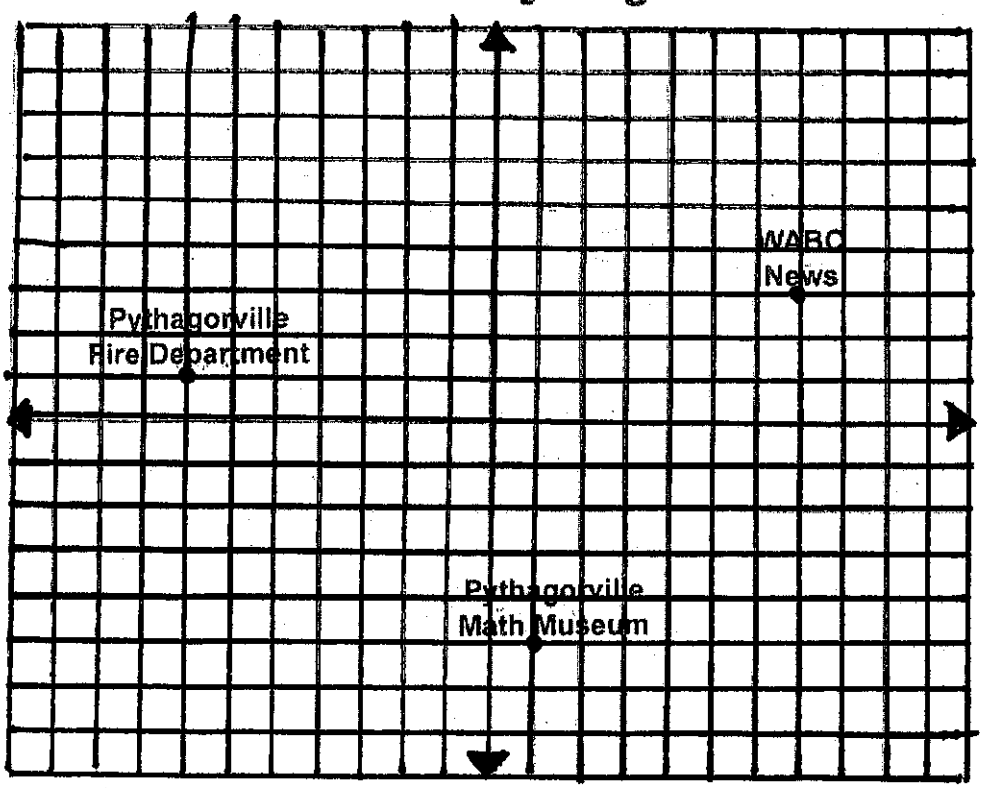
3. A firefighter discovers a victim on the third floor of the Math Museum. The museum is forty-eight feet across and each floor is fourteen feet in height. They exit the inferno through a window that leads to the fire escape. How far has the fire fighter carried the victim when they safely reach the ground? Explain your reasoning.



If a firefighter can carry a victim at a rate of six feet per second, how long will it take them to reach the ground? Explain your reasoning.

4. The victim is airlifted to Pythagorville Hospital. From the museum, the hospital is five blocks east. The airlift helicopter travels thirteen blocks northeast. What are the coordinates of the hospital?

Town Of Pythagorville



Name: Date: Period:

Application Problem	
Brandon knows that his truck route from Illinois to Tennessee is 430 miles long. He also knows that Distance = rate • time ($D = rt$) .How long will his route take if he averages a speed of 50 mi/hr? Start by first solving the formula for time.	
Solution:	**Steps:**
$D = rt$	solve for t (time)
$\frac{D}{r} = \frac{rt}{r}$	
$\frac{D}{r} = t$	substitute 430 in for D and 50 in for r and solve.
$\frac{430}{50} = 8.6$	It will take Brandon **8.6** hours.

Application Problem	
Shoe sizes and foot length are related by the formula $S = 3F - 24$, where S represents the shoe size and F represents the length of the foot, in inches. Solve the formula for F.	
Solution:	**Steps:**
$S = 3F - 24$	add 24 to both sides
$S + 24 = 3F$	divide both sides by 3
$\frac{S+24}{3} = \frac{3F}{3}$	simplify
$\frac{S+24}{3} = F$	

You try:

1. D =rt **Solve for r**

2. P = 2l + 2w **Solve for w**

3. Q = (c + d)/2 **Solve for d**

4. V = (3k)/t **Solve for t**

5. R = 3a + 5c **Solve for a**

Examples taken from regentsprep.org and purplemath.com

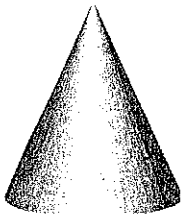
Solving Multivariable Equations

Name_____
Pd_____ Date_____

Solve each equation for the variable requested. Show all work.

1) $2m+y=r$ *for r*	2) $2-ab=c$ *for a*	3) $a-b=c$ *for a*
4) $x+y=z$ *for y*	5) $mnp=q$ *for n*	6) $3+ab=c$ *for a*
7) $3a+2b=c$ *for a*	8) $d=rt$ *for r*	9) $\frac{1}{2}x+y=10$ *for x*
10) $A=\frac{h}{2}(a+b)$ *for b*	11) $a+b=c$ *for b*	12) $A=bh$ *for b*
13) $a-2b=c$ *for b*	14) $A=h(b_1+b_2)$ *for h*	15) $A=p(1+rt)$ *for r*
16) $p=4s$ *for s*	17) $8x-y=13$ *for y*	18) $S=\frac{n}{2}(a+1)$ *for a*
19) $S=180(n-2)$ *for n*	20) $p=a+b+c$ *for c*	21) $V=\frac{4}{3}\pi r^3$ *for r*
22) $8x-7y=15$ *for x*	23) $\frac{x}{y}=z$ *for x*	24) $xy+4=z$ *for x*

Volume of a Cone

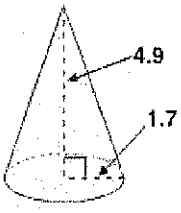


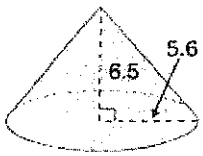
Formula for volume of a cone:

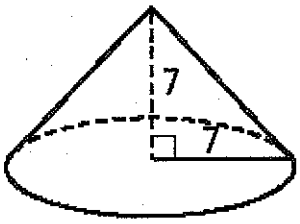
$$V = \frac{1}{3}Bh$$

Where B = area of the base and h is the height of the cone

Find the volume of each cone. Round all answers to the nearest hundredth. (Images taken from Holt Middle School Math Course 3).







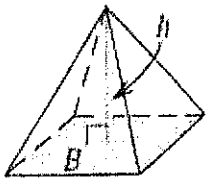
What would be the volume of a cone with a diameter of 10 in and a height of 50 in?

Volume of a Pyramid

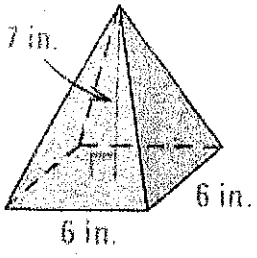
VOLUME OF A PYRAMID

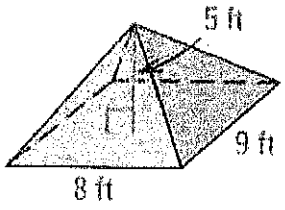
Words Volume = $\frac{1}{3}$(area of base)(height)

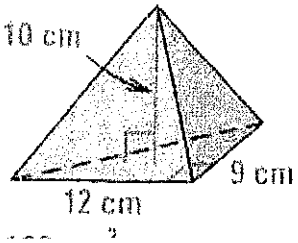
Symbols $V = \frac{1}{3}Bh$

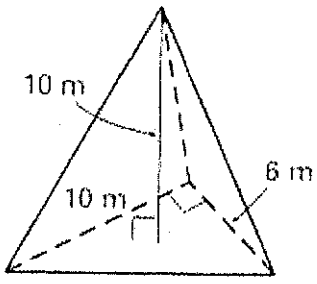


Ex 1 Find the volume of the pyramid.

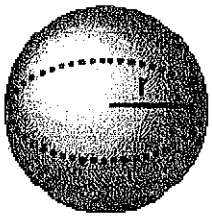








Volume of a Sphere

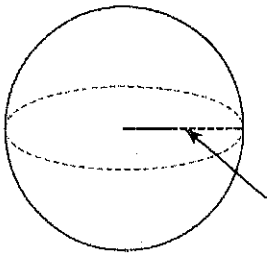


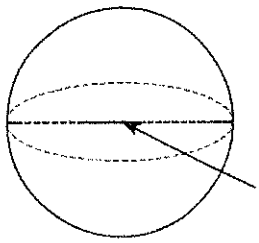
Formula for volume of a sphere:

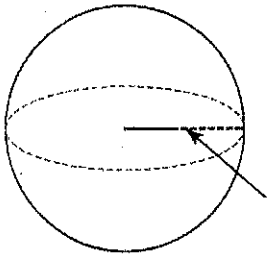
$$V = \frac{4}{3}\pi r^3$$

Where r is the radius of the sphere.

Find the volume of each sphere. Round all answers to the nearest hundredth.







What would be the volume of a sphere with a diameter of 13 cm?

Pre-Algebra

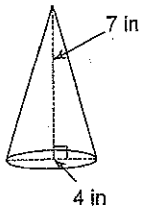
Name_____

Assignment

Date_____ Period____

Find the volume of each figure. Round to the nearest tenth.

1)



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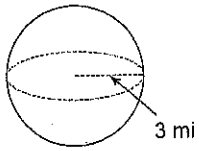

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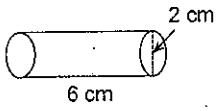

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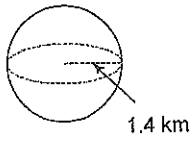

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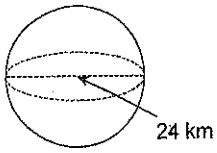

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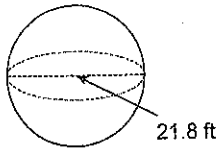
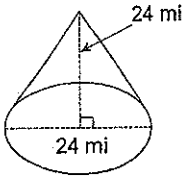
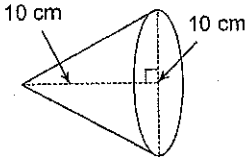


7)



8)



9) A cylinder with a diameter of 8 cm and a height of 3 cm.

10) A sphere with a radius of 8.8 in.

11) A cylinder with a radius of 6 yd and a height of 9 yd.

12) A cone with diameter 4 m and a height of 10 m.

13) A cylinder with a diameter of 12 yd and a height of 10 yd.

14) A sphere with a diameter of 4 cm.

15) A cylinder with a radius of 3 ft and a height of 5 ft.

16) A cylinder with a diameter of 6 m and a height of 12 m.

17) A cylinder with a diameter of 6 ft and a height of 8 ft.

18) A cylinder with a radius of 10 cm and a height of 10 cm.

Name: Date: Period:

Multi-Step Inequalities

Tips for Solving Inequalities:

1. Solve inequalities just like an equation...except for the equal sign is an INEQUALity sign instead.
2. If you multiply or divide by a negative to isolate the variable, you must FLIP the sign.
3. Plug in your answer to be sure your sign is correct!

Let's Try It:

1) $-2b+4>-6$ Step 1: Subtract 4 from both sides

$-4 \quad -4$

$\frac{-2b}{-2} > \frac{-10}{-2}$ Step 2: Divide both sides by -2 to get ***b*** by itself

$b<5$ We ***MUST*** switch the inequality since we divided by a negative number.

2) $6x-4 \le 2x+12$

$-2x \quad -2x$ Step 1: Get the variable ***x*** on one side by subtracting 2x

$4x-4 \le 12$

$+4 \quad +4$ Step 2: Add 4 to both sides

$\frac{4x}{4} \le \frac{16}{4}$ Step 3: Divide both sides by 4 to get ***x*** by itself

$x \le 4$

3) $3a-2(6a-4)>4-1(a+6)$

$3a-12a+8>4-4a-6$ Step 1: Distribute

$-9a+8>-4a-2$ Step 2: Combine like terms (3a-12a = -9a) and (4-6 = -2)

$+4a \quad +4a$ Step 3: Get the variable ***a*** on one side by adding 4a

$-5a+8>-2$

$-8 \quad -8$ Step 4: Subtract 8 from both sides

$\frac{-5a}{-5} > \frac{-10}{-5}$ Step 5: Divide both sides by -5 to get ***a*** by itself

$a<2$ We ***MUST*** switch the inequality since we divided by a negative number.

Partial Notes from teachers.henrico.k12.va.us

Name: Date: Period:

4) $\frac{x}{2} - 1 \geq 3$

$+1 \quad +1$ Step 1: Add 1 to both sides

$(2)\frac{x}{2} \geq 4(2)$ Step 2: Multiply both sides by 2 to get ***x*** by itself

$x \geq 8$

5) $2(y+2) > -4 + 2y$

$2y + 4 > -4 + 2y$ Step 1: Distribute

$-2y \quad -2y$ Step 2: Subtract 2y from both sides

$4 > -4$

Since the variable cancels the answer will be either All Solutions or No Solution. To determine which one we must determine whether the inequality is true or false; true meaning ***All Solutions*** and false meaning ***No Solution***.

Since the inequality $4 > -4$ is true the answer is ***All Numbers***.

6) $2k + 17 \leq -2(8 - k)$

$2k + 17 \leq -16 + 2k$ Step 1: Distribute

$-2k \quad -2k$ Step 2: Subtract 2k from both sides

$17 \leq -16$

Since the inequality $17 \leq -16$ is false the answer is ***No Solution.***

You Try:

1. Solve 5m - 8 > 12.

2. Solve 12 - 3a > 18.

3. Solve 5m - 4 < 2m + 11.

4. Solve 2r - 18 ≤ 5r + 3.

5. Solve 26p - 20 > 14p + 64.

Name_____ Date_____ Period_____

More Inequalities Investigation

In questions 1 – 5, substitute the given value of x into the inequality and simplify. Is the inequality True or False after simplifying for the given value of x?

	x	$2x - 3 > 5$	True or False
1	10		
2	5		
3	20		
4	-5		
5	-20		
6	-10		

7. Are there any patters related to the x-values and if the inequality is T or False?

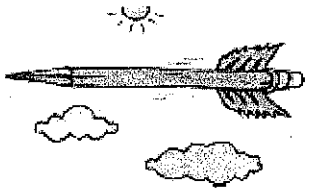
8. How could the false inequalities be made true?

9. Using x = 10 as a reference point, how was x manipulated to get x = -10?

10. Using the manipulations of the x value found in #9, can you generate a rule for how to make the false inequalities true always?

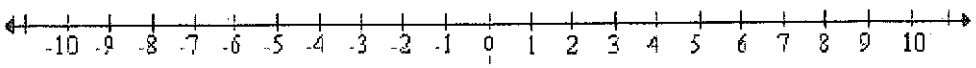
Inequalities

Name_____

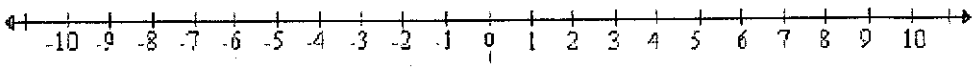


Solve the following inequalities and graph the solution sets on the number lines. Please show work.

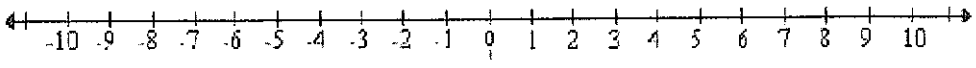
1. $x - 4 > 1$



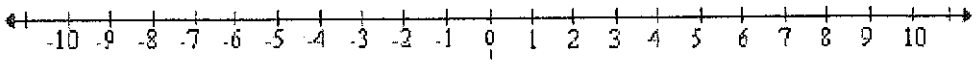
2. $x + 1 \leq 4$



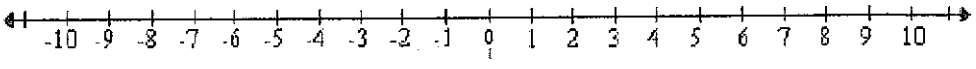
3. $4y \geq 8$



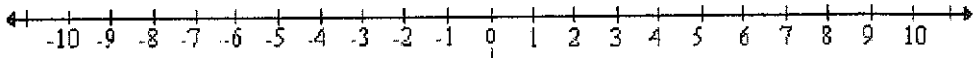
4. $-5w < 10$



5. $4x > -28$



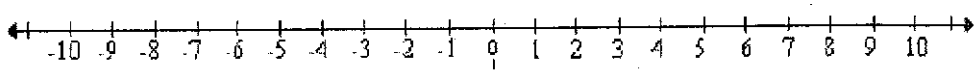
6. $27 > -9y$



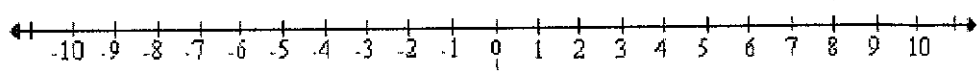
7. $2y + 7 < 17$

8. $2(2x - 8) - 8x \leq 0$

9. $5x + 4 \leq 11 - 2x$



10. $5x - (x - 8) > 9 + 3(2x - 3)$



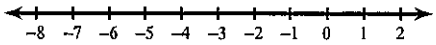
Infinite Algebra 1 Name_____

Multi-Step Inequalities

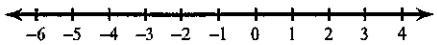
Date_____ Period____

Solve each inequality and graph its solution.

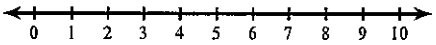
1) $3 < -5n + 2n$



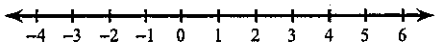
2) $6x + 2 + 6x < 14$



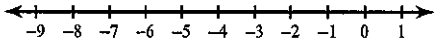
3) $-p - 4p > -10$



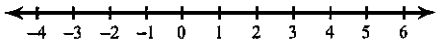
4) $18 \geq 5k + 4k$



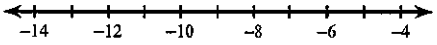
5) $9 \geq -2m + 2 - 3$



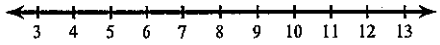
6) $-3 - 6(4x + 6) > -111$



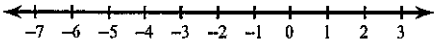
7) $6 - 4(6n + 7) \geq 122$



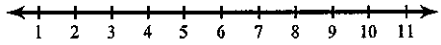
8) $-138 \geq -6(6b - 7)$



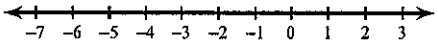
9) $167 < 6 + 7(2 - 7r)$



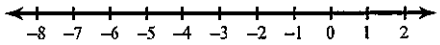
10) $5(6 + 3r) + 7 \geq 127$



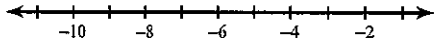
11) $-8x + 2x - 16 < -5x + 7x$



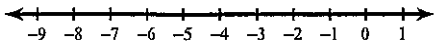
12) $-1 - 6x - 6 > -11 - 7x$



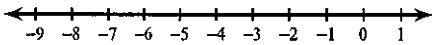
13) $a - 6 \leq 15 + 8a$



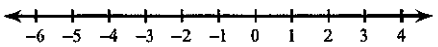
14) $13 + 2v - 8 + 6 > -7 - v$



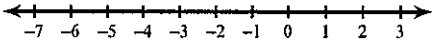
15) $-5n - 6n \leq 8 - 8n - n$



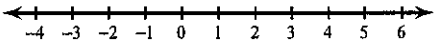
16) $-x < -x + 7(x - 2)$



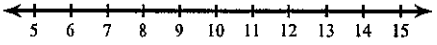
17) $-5n + 6 \geq -7(5n - 6) - 6n$



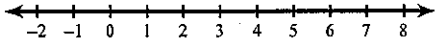
18) $3(p - 3) - 5p > -3p - 6$



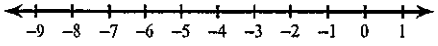
19) $28 - k \geq 7(k - 4)$



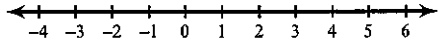
20) $28 - 7x \leq -4(-7x - 7)$



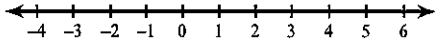
21) $-6(1 + 7k) + 7(1 + 6k) \leq -2$



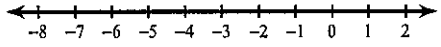
22) $-2(2 - 2x) - 4(x + 5) \leq -24$



23) $3(1 - 2x) > 3 - 6x$



24) $-2(5 + 6n) < 6(8 - 2n)$

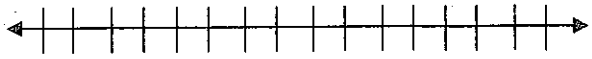


Name _____ Date _____ Core _____

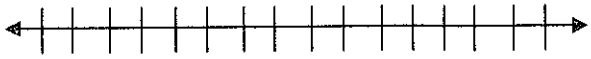
Solving Word Problems with Inequalities

In this lesson we will gain an idea of how the inequalities have meaning in our lives. Often, people unwittingly use the concept of inequalities in their everyday lives.

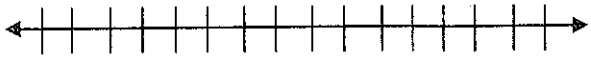
1) The low temperatures for the previous two days were 62° and 58°. What would the temperature need to be for the third day such that the average daily temperature is at least 64°.



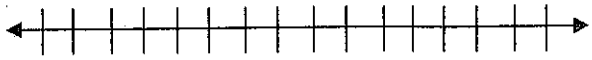
2) Gabriella is a waitress at the Hampton Grille. In one night she earned at least $75 while working a six-hour shift. If Gabriella earned $31.50 in tips, find all possibilities for the amount she earned in wages per hour.



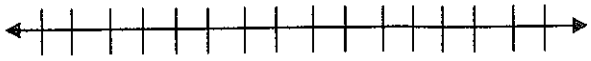
3) There are 40 children and 12 adults going on a trip to New York City by car. Each car can hold a maximum of 5 people. What is the least number of cars needed for the trip?



4) On her last two math tests, Larisa had scores of 83 and 92. Assuming that Larisa cannot score above a 100 on any given test, determine all possible scores Larisa can score to average at least a 90 on all three tests.



5) Manuel takes a job translating English instruction manuals to Spanish. He will receive $15 per page plus $100 per month. Manuel would like to work for 3 months during the summer and make at least $1,500. Write an inequality to find the minimum number of pages Manuel must translate in order to reach his goal.



6) Carlos goes to the fair where it costs $5 to get in and $0.80 per ride. If he is only allowed to spend at most $25, how many rides can he go on?

7) Kristina bought suckers for her children. She gave Linus half of the ones she bought but ended up taking 5 away from him by the end of the day due to poor behavior. She gave Nicholas one third of the ones she bought and 3 extra by the end of the day due to good behavior. Linus had at least as many suckers as Nicholas had at the end of the day. What is the minimum number of suckers Kristina bought?

8) Annah has an assortment of post-it notes in pink, blue, yellow and green. She has 4 times as many blue as pink, three times as many yellow as pink, and twice as many green as pink. Annah has fewer than 120 post-its. What is the most number of pink post-it notes she could have?

9) The track team at Hale High School plans to sell t-shirts to raise money for new equipment. At Ted's Tees, printing costs are $0.80 per shirt and the cost for each T-shirt is $3.75. The shop also charges a $125 fee per order for the silk-screen design. In order for the track team to make a profit, the income from selling the T-shirts must be greater than the cost of making the T-shirts. How many shirts must they sell to make a profit?

   a. The coach has decided that $8.95 is too expensive per shirt. How will lowering the price of the t-shirt effect the number of shirts you have to sell to make a profit?

10) Jane is selling bracelets to earn money for Spring Break. She needs $520 for airfare and $130 for the hotel. Any other money she needs will be for food and entertainment. It costs $3.25 to make each bracelet. If she only plans on making 200 bracelets, how much will she have to sell them for to make her goal?