**Solve the following Inequalities.**

1. 2(2x + 20) ≥ 40

**Solve the following compound inequalities**

1. –4 < r –5 ≤ –1
2. 4v + 3 < –5 or –2v + 7 < 1
3. 7 < –3n + 1 ≤ 13
4. –2x + 7 > 3 or 3x – 4 ≥ 5
5. –3 < 2x – 1 < 7

**Solve the following word problems**

1. Five less than one-half a number is greater than 12.
2. Sam and Alex play in the same soccer team. Last Saturday Alex scored 3 more goals than Sam, but together they scored less than 9 goals. What are the possible number of goals Alex scored?
3. The length of a rectangle is 5 times its width. The perimeter of the rectangle is at most 104 meters. Find the greatest possible dimensions of this rectangle.
4. The velocity of an object fired directly upward is given by *V* = 80 – 32*t*, where *t* is in seconds. When will the velocity be between 32 and 64 feet per second?

1. The antifreeze added to your car's cooling system claims that it will protect your car to -35º C and 120º C.  The coolant will remain in a liquid state as long as the temperature in Celsius satisfies the inequality -35º < C < 120º.  Write this inequality in degrees Fahrenheit.

Hint:

1. The height of a horse is measured in a vertical line from the ground to the withers (at the base of the neck).  Horses are measured in "hands" where one hand = 4 inches.  If a horse is more than an exact number of hands high (*hh*), the extra inches are given after a decimal point, e.g. 14 hands 2 inches is written as 14.2 *hh*.  Normal riding horses are between 14.3 *hh* and 17 *hh*, inclusive.  Horses shorter than 14.3 hands are called ponies and horses over 17 *hh* are often called draft (or work) horses.

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| a.)  Write an inequality statement to represent the heights of normal riding        horses in inches.  b.)  Write an inequality statement stating the heights, in inches, of equines        (horses) that do not fit the normal riding horse height specifications. | | |
|  | |  |  | |

**Answers**

**Solve the following Inequalities.**

1. 2(2x + 20) ≥ 40

1. 

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**Solve the following compound inequalities**

1. –4 < r –5 <-1

-4 + 5 < r < -1 + 5

1 < r < 4

1.0 1.5 2.0 2.5 3.0 3.5 4.0

1. 4v + 3 < -5 or –2v + 7 < 1

4v < -5 -3 or -2v < 1 – 7

-5 0 5

1. 7 < 3n + 1 ≤ 13

6 < 3n ≤ 12

2 > n ≥ 4

-4.0 -3.5 -3.0 -2.5 -2.0

1. –2x + 7 > 3 or 3x – 4 ≥ 5

–2x > -4 or 3x ≥ 9

x < 2 or x ≥ 3

-2 0 2 4 6 8

**Solve the following word problems**

1. Five less than one-half a number is greater than 12.

Let the unknown number be x.   
one-half that number will be ½ x   
five less than ½ x will be ½ x -5   
½ x - 5 is greater than 12   
so the result is ½ x - 5 > 12

1. Sam and Alex play in the same soccer team.   
   Last Saturday Alex scored 3 more goals than Sam, but together they scored less than 9 goals.

What are the possible number of goals Alex scored?

The number of goals Alex scored: S + 3

The number of goals Sam scored: S

S + (S + 3) < 9

2S + 3 < 9

2S < 9 – 3

2S < 6

S < 3

Note that the number of goals must be a whole number.

Sam could have scored 0, 1 or 2 goals.

Alex could have scored 3, 4, or 5 goals.

1. The length of a rectangle is 5 times its width. The perimeter of the rectangle is at most 104 meters. Find the greatest possible dimensions of this rectangle.

Assume that width is x.

The length is 5x

1. The velocity of an object fired directly upward is given by *V* = 80 – 32*t*, where *t* is in seconds.   
     
   When will the velocity be between 32 and 64 feet per second?

    32 < 80 – 32*t* < 64

32 – 80 < 80 – 80 – 32*t* < 64 – 80   
    –48 < –32*t* < –16

    1.5 > *t* > 0.5

1. The antifreeze added to your car's cooling system claims that it will protect your car to -35º C and 120º C.  The coolant will remain in a liquid state as long as the temperature in Celsius satisfies the inequality  
    -35º < C < 120º.  Write this inequality in degrees Fahrenheit.

Hint:

1. The height of a horse is measured in a vertical line from the ground to the withers (at the base of the neck).  Horses are measured in "hands" where one hand = 4 inches.  If a horse is more than an exact number of hands high (*hh*), the extra inches are given after a decimal point, e.g. 14 hands 2 inches is written as 14.2 *hh*.  Normal riding horses are between 14.3 *hh* and 17 *hh*, inclusive.  Horses shorter than 14.3 hands are called ponies and horses over 17 *hh* are often called draft (or work) horses.

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| a.)  Write an inequality statement to represent the heights of normal riding        horses in inches. b.)  Write an inequality statement stating the heights, in inches, of equines        (horses) that do not fit the normal riding horse height specifications.  a.)  Normal riding horse heights in hands:  14.3 *hh* < *h* < 17 *hh*  Convert to inches. 14.3 *hh* = 14(4) + 3 inches  = 59 inches  17 *hh* = 17(4) inches  = 68 inches  Normal riding horse height in inches: 59" < *h* < 68"  b.)  Equines outside of the normal riding horse heights in hands:     *h* < 14.3 *hh*  or  *h* > 17 *hh*  Use conversions from part a.  Equine heights in inches not fitting the normal riding horse heights:    *h* < 59"  or   *h* > 68" |