

Express each unknown by an algebraic expression using the same variable. Translate the situation into an inequality.

The sum of two consecutive odd numbers is at least 112. What are the smallest possible odd numbers?

x
 $x+2$
~~3x~~
 $(x) - 5$
 $2x$
 $2x-1$
 $2x+1$
 $2x+1 + 2x+3 \geq 112$
 $4x+4 \geq 112$

$1, 3, 5$
 $2x+1$
 $2x-1+2$
 $2x+1+2 = 2x+3$
 $112-4$

$2(27)+1$
 $= 55$
 $+2 = 57$

$\frac{4x}{4} \geq \frac{108}{4}$
 $x \geq 27$

5. a) $x > 6$ b) $x \leq 1$ c) $x \leq -4$ d) $x < -12$ e) $x > -4$
 f) no solution g) $x \leq \frac{31}{14}$ or $x \leq 2.21$ h) $x \leq -0.5$

6. 1) a) Jana: x Julie: $120 - x$

b) $x > 120 - x$

c) $2x > 120$ so $x > 60$. But since Jana could have taken 70, 80, 90 or 119 photos, the minimum number of pictures taken by each is 1.

2) a) Shoes: x Coat: $x + 20$

b) $x + x + 20 \leq 60$ $60 \geq 20 + x + x$
 $2x + 20 \leq 60$
 c) $x \leq 20$ The max price for shoes is \$20, coat \$40

3) a) First number: $2x$ Second: $2x + 2$ Third: $2x + 2 + 2$

b) $2x + 2x + 2 + 2x + 2 + 2 \geq 228$ $7x + 4$

c) $6x + 6 \geq 228$

$6x \geq 222$

~~$x \geq 74$~~ $x \geq 37$

The three smallest possible numbers are 74, 76, 78

8. a) max width: 133 cm

b) max area: 35 378 cm²

$L = 2x$
 $w = x$
 $2x + 2(2x)$
 $2x + 4x < 798$
 $6x < 798$
 $x < 133$
 $2x(x)$
 $2x^2 \leq 133(266)$

Solving Inequalities in Word Problems

1. Read and highlight key information.
2. Find the relationship between the unknowns.
3. Represent the unknowns as variables.
4. Construct the inequalities and solve.

e.g. WB p. 115 # 11.

1. A group of over 30 people has 4 more girls than boys. What is the minimum possible number of girls in this group?

$$3. \text{ B: } x \quad \text{G: } x + 4$$

$$x + x + 4 > 30$$

$$2x + 4 > 30$$

$$2x > 26$$

$$x > 13$$

$$\cancel{13} \quad 14 \quad 18$$

$$13 + 17 > 30$$

