

Algebra II

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2)	37 trips	8)	between 72 and 85.5, inclusive
3)	9cm	9)	8cm
4)	3,4,5, or 6 units	10)	between 15 and 30cm.
5)	{5,7,9} {7,9,11}	12)	more than 24 mph.
6)	{8,10,12} {10,12,14} {12,14,16}	13)	At most 2min 30sec.
7)	93	14)	16cm x 34cm

- 2) The usual toll charge to use the Bingham tunnel is 50 cents. If you purchase a special sticker for \$5.50, the toll is only 35 cents. At least how many trips through the tunnel are needed before the sticker costs less than paying for each trip separately?

- 3) The length of a rectangle is 5 cm more than twice the width. Find the largest possible width if the perimeter is at most 64 cm.

$$\begin{aligned} \text{Let } x &= \text{width} \\ 2x+5 &= \text{length} \end{aligned}$$

$$\boxed{9\text{cm}}$$

$$x + (2x+5) + x + (2x+5) \leq 64$$

$$6x + 10 \leq 64$$

$$6x \leq 54$$

$$x \leq 9$$

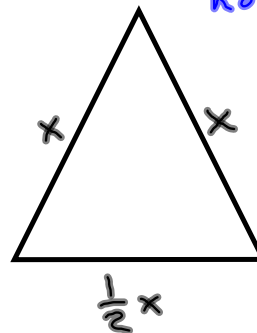
- 4) The lengths of the legs of an isosceles triangle are integers. The base is half as long as each leg. What are the possible lengths of the legs if the perimeter is between 6 units and 16 units? *no Fraction no decimals*

$$6 < x + x + \frac{1}{2}x < 16$$

$$6 < \frac{5}{2}x \text{ and } \frac{5}{2}x < 16$$

$$\frac{12}{5} < x \qquad x < \frac{32}{5}$$

3, 4, 5, 6 units



- 5) Find all sets of three consecutive odd integers whose sum is between 20 and 30.

Let $x =$ smallest
 $x+2 =$ 2nd
 $x+4 =$ largest

5, 7, 9
7, 9, 11

$$20 < x + (x+2) + x + 4 < 30$$

$$20 < 3x + 6 < 30$$

$$\frac{14}{3} < \frac{3x}{3} < \frac{24}{3}$$

$$\frac{14}{3} < x < 8$$

$$4\frac{2}{3} \quad 5, 7$$

- 6) Find all sets of three consecutive even integers whose sum is between 25 and 45.

- 7) Jeannie's scores on her first four test were 80, 65, 87, and 75. What will she have to score on her next test to obtain an average of at least 80 for the term?

$$\frac{80+65+87+75+x}{5} \geq 80$$

- 8) Jim's second test score was 8 points higher than his first score. His third score was 88. He had a B average (between 80 and 89, inclusive) for the three tests. What can you conclude about his first test score?

Let $x = 1^{\text{st}}$ score

$$x + 8 = 2^{\text{nd}}$$

$$80 \leq \frac{x + (x + 8) + 88}{3} \leq 89$$

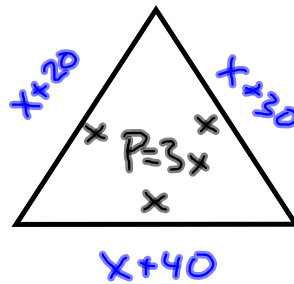
- 9) The sides AB and AD of a square are extended 10 cm and 6 cm, respectively, to form sides AE and AF of a rectangle. At most how long is the side of the square if the perimeter of the rectangle is at least twice the perimeter of the square?

- 10) The three sides of an equilateral triangle are increased by 20 cm, 30 cm, and 40 cm respectively. The perimeter of the resulting triangle is between twice and three times the perimeter of the original triangle. What can you conclude about the length of a side of the original triangle?

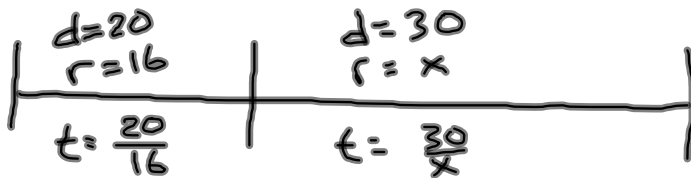
$$6x < (x+20) + (x+30) + (x+40) < 9x$$

$$6x < 3x + 90 < 9x$$

$$6x < 3x + 90 \text{ and } 3x + 90 < 9x$$



- 12) During the first 20 mi of a 50 mi bike race, Roger's average speed was 16 mph. What must his average speed be during the remainder of the race if he is to finish the race in less than 2.5 h? $d=rt$ $t=\frac{d}{r}$



$$\frac{5}{4} + \frac{30}{x} < \frac{5}{2}$$

- 13) A subway train makes six stops of equal length during its 21 km run. The train is actually moving for 20 min of the trip. At most how long can the train remain at each station if the average speed for the trip, including stops, is to be at least 36 km/h?

$$r = \frac{d}{t} \quad d = rt$$

Let $x =$ Length of Stop

$$\frac{21}{\frac{1}{3} + 6x} \geq 36$$

$$21 \geq 36 \left(\frac{1}{3} + 6x \right)$$

$$21 \geq 12 + 216x$$

$$9 \geq 216x$$

$$.041\bar{6} = \frac{9}{216} \geq x$$

$$\frac{1}{24} \cdot \frac{60}{1} = \boxed{2.5 \text{ min}}$$

- 14) The length of a rectangular sheet of paper was twice its width. After 1 cm was trimmed from each edge of the sheet, the perimeter was at most 1 m. Find the largest possible dimensions of the trimmed sheet.