

Take Home Quiz Solutions

- ① * sets of 4 consecutive odds, positive
- * sum is AT MOST 25

x = smallest odd integer

$$x + (x+2) + (x+4) + (x+6) < 25$$

$$4x + 12 < 25$$

$$\begin{array}{r} -12 \quad -12 \\ \hline 4x < 13 \end{array}$$

$$\frac{4x}{4} < \frac{13}{4}$$

$$x < 3.25$$

→ x can be 1 or 3

Answer: The sets are {1, 3, 5, 7} and {3, 5, 7, 9}

- ② * pairs of consecutive even integers, > 73, < 79

x = smallest even integer

$$73 < x + (x+2) < 79$$

$$73 < 2x + 2 < 79$$

$$\begin{array}{r} -2 \quad -2 \quad -2 \\ \hline 71 < 2x < 77 \end{array}$$

$$\frac{71}{2} < \frac{2x}{2} < \frac{77}{2}$$

$$35.5 < x < 38.5$$

$$35.5 < x < 38.5$$

→ x can be 36 or 38

Answer: The pairs are {36, 38} and {38, 40}

③ * at most \$20.00

* sets have 6 nickels, 4 dimes, 1 quarter → \$.95 each

$x = \#$ of sets of coins

$$\frac{.95x < 20}{.95 \quad .95}$$

$$x < 21.05 \rightarrow \text{highest } x \text{ is } 21$$

Answer: Steve could bring 21 sets of coins to sell.

④ * Heather's age is 3 more than $\frac{1}{2}$ Rachel

$$\hookrightarrow H = \frac{1}{2}R + 3$$

* Difference in ages is less than 4 years

$$R - 4 < H$$

* substituted *

$R = \text{Rachel's age}$

$$R - 4 < \left(\frac{1}{2}R + 3\right)$$

$$2(R - 4) < 2\left(\frac{1}{2}R + 3\right)$$

$$2R - 8 < R + 6$$

$$\begin{array}{r} +8 \qquad \qquad +8 \\ \hline 2R - 8 < R + 6 \end{array}$$

$$2R < R + 14$$

$$\begin{array}{r} -R \quad -R \\ \hline 2R < R + 14 \end{array}$$

$$R < 14 \rightarrow \text{highest age is } 13 \text{ (can't be } 14)$$

Answer: The oldest Rachel can be is 13 years old.

- ⑤ * Friday $\rightarrow 86$
 * Tuesday $\rightarrow 8$ more than Thursday
 * average score between 80 & 84 (non-inclusive)

x = Thursday's golf score

Thurs $\rightarrow x$

Tues $\rightarrow x+8$

Fri $\rightarrow 86$

$$80 < \frac{x + (x+8) + 86}{3} < 84$$

$$3 \left(80 < \frac{x + (x+8) + 86}{3} < 84 \right)$$

$$240 < 2x + 94 < 252$$

$$\begin{array}{r} -94 \qquad \qquad -94 \qquad -94 \\ \hline 146 < 2x < 158 \end{array}$$

$$\frac{146}{2} < \frac{2x}{2} < \frac{158}{2}$$

$$73 < x < 79$$

x can be 74, 75, 76, 77, 78

\uparrow
lowest

\uparrow
highest

Answer: Nancy's lowest score could be 74
and her highest score could be 78.