Miscellaneous Exercise on Chapter 5

Solve the inequalities in Exercises 1 to 6.

1. $2 \le 3x - 4 \le 5$

2. $6 \le -3\,(2x - 4) < 12$

3. $-3 \le 4 - \frac{7x}{2} \le 18$

4. $-15 < \frac{3(x-2)}{5} \le 0$

5. $-12 < 4 - \frac{3x}{-5} \le 2$

6. $7 \le \frac{(3x+11)}{2} \le 11$.

Solve the inequalities in Exercises 7 to 10 and represent the solution graphically on number line.

7. $5x + 1 > -24$, $5x - 1 < 24$

8. $2\,(x - 1) < x + 5$, $3\,(x + 2) > 2 - x$

9. $3x - 7 > 2\,(x - 6)$, $6 - x > 11 - 2x$

10. $5\,(2x - 7) - 3\,(2x + 3) \le 0$, $2x + 19 \le 6x + 47$.

11. A solution is to be kept between 68° F and 77° F. What is the range in temperature in degree Celsius (C) if the Celsius / Fahrenheit (F) conversion formula is given by

$$F = \frac{9}{5} C + 32 \ ?$$

12. A solution of 8% boric acid is to be diluted by adding a 2% boric acid solution to it. The resulting mixture is to be more than 4% but less than 6% boric acid. If we have 640 litres of the 8% solution, how many litres of the 2% solution will have to be added?

13. How many litres of water will have to be added to 1125 litres of the 45% solution of acid so that the resulting mixture will contain more than 25% but less than 30% acid content?

14. IQ of a person is given by the formula

$$IQ = \frac{MA}{CA} \times 100,$$

where MA is mental age and CA is chronological age. If $80 \leq IQ \leq 140$ for a group of 12 years old children, find the range of their mental age.