Secondary 3 Mathematics · Practice Worksheet · tutorinmontreal.ca

Algebra - Equations and Inequalities

Name: _____ Date: _____

Concepts

- Algebra - Equations and Inequalities
- General Methods for Solving Equations
- Representing a Solution Set
- Solving Algebraic Inequalities
- Solving Equations and Inequalities
- Solving First-Degree Equations and Inequalities

Algebra - Equations and Inequalities

1. Translate each statement into an equation or an inequality using the variable named, say which of the two you wrote, then solve it.

a) A skatepark charges a \$4 entry fee plus \$2.50 for each hour on the ramps. Léa paid \$14 in all. Let h be her number of hours.

b) A minibus may carry at most 22 passengers. Seven adults are already seated and n students still have to board.

c) Three times a number, decreased by 8, is more than 25. Let n be the number.

Finally, say which of your three answers is a single value and which is a whole collection of values.

General Methods for Solving Equations

2. Solve each equation, then **verify** your solution in the original equation.

a) $6x - 11 = 2x + 21$

b) $\dfrac{2x + 1}{3} = 7$

c) $5(2x - 3) - 4x = 27$

Representing a Solution Set

3. Answer each part.

a) Solve $2x - 9 \leq 5$ over the real numbers. Give the solution set in set-builder notation and in interval notation, and say whether the endpoint on a number line is a solid or an open point.

b) Write out, as a list between braces, the set $\{x \in \mathbb{Z} \mid -3 \leq x < 4\}$.

c) A ride at the fair admits anyone whose height is at least 130 cm and less than 195 cm. Write the set of admissible heights, in centimetres, in interval notation and in set-builder notation.

Solving Algebraic Inequalities

4. Solve each inequality over the real numbers and give each solution set in interval notation.

a) $5x + 8 < 3x + 20$

b) $-2x + 7 \geq 15$

c) $\dfrac{x}{4} - 3 > 1$

Then state which part forced you to reverse the inequality symbol, and why.

Solving Equations and Inequalities

5. A community garden charges each member a \$90 seasonal plot fee plus \$12 for every bag of compost taken. Let b be the number of bags.

a) Write the rule giving the total cost, in dollars.

b) Rosalie's bill came to exactly \$450. Write and solve an equation to find how many bags she took.

c) Marc will not spend more than \$450. Write and solve an inequality, and state how many bags he may take.

Solving First-Degree Equations and Inequalities

6. Solve each of the following. For each one, state how many solutions it has.

a) $4(x - 3) = 2(x + 5)$

b) $3(x + 2) > 5x - 4$, over the real numbers, with the answer in interval notation

Synthesis — drawing on several sheets in this topic

7. A hockey tournament charges each team a \$145 registration fee plus \$35 for every player on its roster.

a) Write the rule giving the total cost C for a team of n players.

b) The Rimouski team paid \$600. Write and solve an equation to find its number of players, and verify your answer.

c) A second team's budget is at most \$810. Write and solve an inequality, give the solution set in interval notation, then state how many players the team may actually register and explain why the interval on its own is not the final answer.