Inequalities Review Name: Answer Key

Section 1: Representing Inequalities

1) Write these inequalities verbally (using words):

a) $X \geq -3$ x is greater than or equal to -3

b) $X < 8$ x is less than 8

c) $X \neq 2$ x is not equal to 2

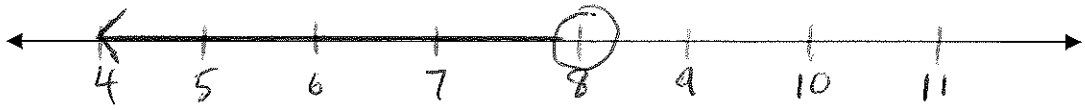
d) $-9 \leq X \leq -4$ x is less than or equal to -4
x is greater than or equal to -9

e) $X \leq -\frac{3}{4}$ x is less than or equal to $-\frac{3}{4}$

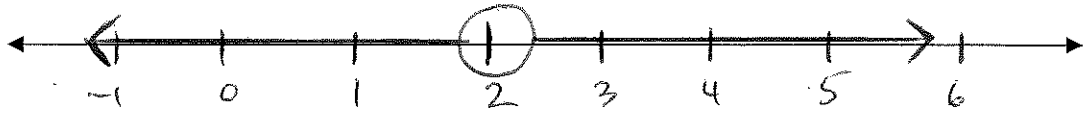
2) Represent these inequalities graphically (on a labelled number line):

a) $X \geq -3$

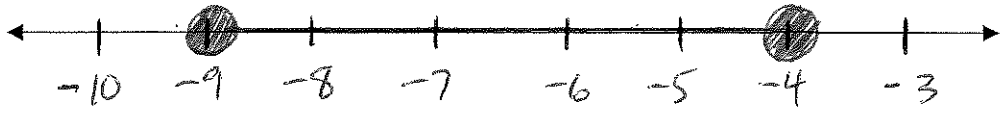
b) $X < 8$



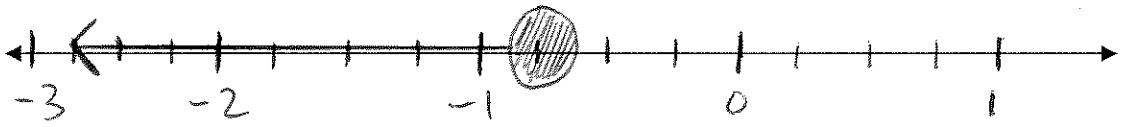
c) $X \neq 2$



d) $-9 \leq X \leq -4$



e) $X \leq -\frac{3}{4}$



3) Give three possible values for X:

a) $X \geq -3$ $-1, 7, 100$

b) $X < 8$ $3, -2, -50$

c) $X \neq 2$ $-11, 0, 16$

d) $-9 \leq X \leq -4$ $-8, -7, -6$

e) $X \leq -\frac{3}{4}$ $-1, -1\frac{1}{2}, -3\frac{3}{4}$

4) Write an inequality to represent each statement:

a) In Manitoba, you must be at least 16 years of age to operate a automobile on your own.

$x \geq 16$

b) The Slinky toy is not recommended for children under 5.

$T \geq 5$

c) In Jackpot Lake, fish less than 20 cm that are caught must be released.

$F < 20$

d) Canadian Tire advertised savings up to 70 %.

$S \leq 70$

f) There are about 37 different species of butterflies in Manitoba.

$B \leq 37$

g) Zeke's dad said that if he can save at least $ 4000, he would help him but a car.

$S \geq 4000$

h) At Mr. Crupi's Pizza Place, you get a free pizza if you spend at least $ 25 but no more than $ 39.99.

$25 \leq x \leq 39.99$

Section 2: Solving One step Inequalities

1) Solve these inequalities:

a) $\frac{4X}{4} \leq \frac{36}{4}$

$X \leq 9$

b) $\frac{19}{2} > \frac{2X}{2}$

$9\frac{1}{2} > X$

c) $\frac{48}{-8} \geq \frac{-8X}{-8}$

$-6 \leq X$

d) $\frac{X \cdot 3}{3} < -9 \cdot 3$

$X < -27$

e) $-1X + 7 \leq -18$

$+7 \quad +7$

$\frac{-1X}{-1} \leq \frac{-11}{-1}$

$X \geq 11$

f) $12 \cdot 4 > \frac{-1X \cdot 4}{4}$

$48 > -1X$

$\frac{48}{-1} > \frac{-1X}{-1}$

$-48 < X$

2) For each inequality above, give three possible values for X

a) 5, 6, 9

b) 1, 2, 3

c) -2, -3, -4

d) -30, -40, -50

e) 11, 12, 13

f) -20, 0, 15

3) Trevor was asked to solve the inequality $-2X \geq 11$. He said that the answer was $X \geq -5.5$. Is he correct? Explain.

$\frac{-2x}{-2} \geq \frac{11}{-2}$

$x \leq -5.5$

He is not correct because his sign was not "Flipped". When you divide x by a negative the sign flips. His boundary point is correct.

4) Skylar is planting trees as a summer job. She gets paid $ 0.10 per tree planted. She wants to earn at least $ 20/ hr. How many trees must she plant per hour in order to achieve her goal?

a) Write an inequality to model this problem. $0.10T \geq 20$

b) Solve the inequality and interpret the solution.

$$\frac{0.10T}{0.10} \geq \frac{20}{0.10}$$

$$T \geq 200$$

Skylar must plant 200 or more trees.

5) EB Games is offering games on sale for $ 12.50, including tax. Sawyer has set his spending limit at $ 80. How many games can he buy and stay within his limit?

a) Write an inequality to model this problem. $12.50G \leq 80$

b) Solve the inequality and interpret the solution.

$$\frac{12.50G}{12.50} \leq \frac{80}{12.50}$$

$$G \leq 6.4$$

Sawyer can buy 6 games.

6) Lindsay and her friends went out for dinner and now she wants to take her friends out to a movie. Each ticket costs $ 6.75 and she only has $ 90. How many tickets can she buy and stay within her budget?

a) Write an inequality to model this problem. $6.75T \leq 90$

b) Solve the inequality and interpret the solution.

$$\frac{6.75T}{6.75} \leq \frac{90}{6.75}$$

$$T \leq 13.33$$

Lindsay can buy 13 tickets

Section 3: Solving Multi-step Inequalities

1) Solve the following inequalities:

a) $-4X + 5 \geq -43$

$-5 \quad -5$

$\frac{-4x}{-4} \geq \frac{-48}{-4}$

$x \leq 12$

b) $\frac{x}{-2} + 4 < 12$

$-4 \quad -4$

$\frac{x}{-2} \cdot -2 < 8 \cdot -2$

$x > -16$

c) $15 + 6X \leq 3X + 30$

$-15 \quad -3x \quad -3x \quad -15$

$\frac{3x}{3} \leq \frac{15}{3}$

$x \leq 5$

d) $3(4X + 2) > -2(X - 6)$

$12x + 6 > -2x + 12$

$+2x \quad -6 \quad +2x \quad -6$

$\frac{14x}{14} > \frac{6}{14}$

$x > \frac{3}{7}$

e) $\frac{1}{2}X - 4 < \frac{3}{5}$

$\frac{x}{2} \cdot \frac{10}{1} - \frac{4}{1} \cdot \frac{10}{1} < \frac{3}{5} \cdot \frac{10}{1}$

$5x - 40 < 6$

$+40 \quad +40$

$\frac{5x}{5} < \frac{46}{5}$

$x < 9\frac{1}{5}$

2) For each inequality in #1, give 2 possible values for X:

a) 1, 2 b) -3, 8 c) 0, 4

d) 12, $20\frac{1}{2}$ e) 3, -10

3) The grade 9 Leadership students planned a grad dinner and they rented a hall for $ 150. The dinner was going to cost the Leadership group $ 18 per student. The group had no more than $ 1500 to spend on this function. How many students could attend this event. **Write an inequality and solve. Interpret your solution.**

x

$18x + 150 \leq 1500$

$-150 \quad -150$

$\frac{18x}{18} \leq \frac{1350}{18}$

$x \leq 75$

75 students could attend this event

4) The Lightning soccer club plans to buy shirts for its team and its fans.
Pro-V Graphics charges a $ 75 set-up fee plus $ 7 per shirt.
BT Designs has no set-up fee but charges $ 10.50 per shirt.
How many shirts does the team need to order for Pro-V Graphics to be the cheaper and better option? **Write an inequality and solve. Interpret your solution.**

x

Pro V BT

$75 + 7x < 10.50x$

$-7x \quad -7x$

$\frac{75}{3.50} < \frac{3.50x}{3.50}$

$21.43 < x$

The team must buy at least 22 shirts for PRO-V to be cheaper and better.

5) Mr. Crupi was saving his money for a family vacation to Mexico. The hotel and airfare was expected to cost $ 6500. He already had $ 1200 saved in the bank.
He planned to save $ 750 per month to pay for this trip.
How many months will he need to work to afford this trip?
Write an inequality and solve. Interpret your solution.

$750M + 1200 \geq 6500$

$-1200 \quad -1200$

$\frac{750M}{750} \geq \frac{5300}{750}$

$M \geq 7.07$

Mr. Crupi must work 8 months or more to afford his trip