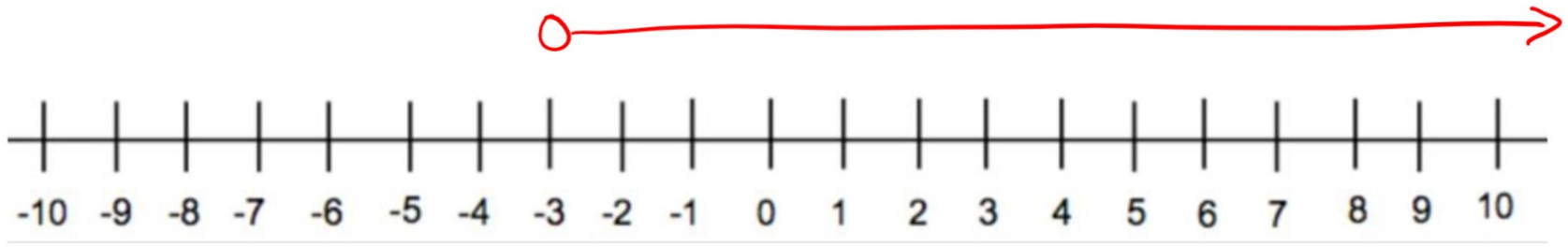
Inequalities Exam Practice

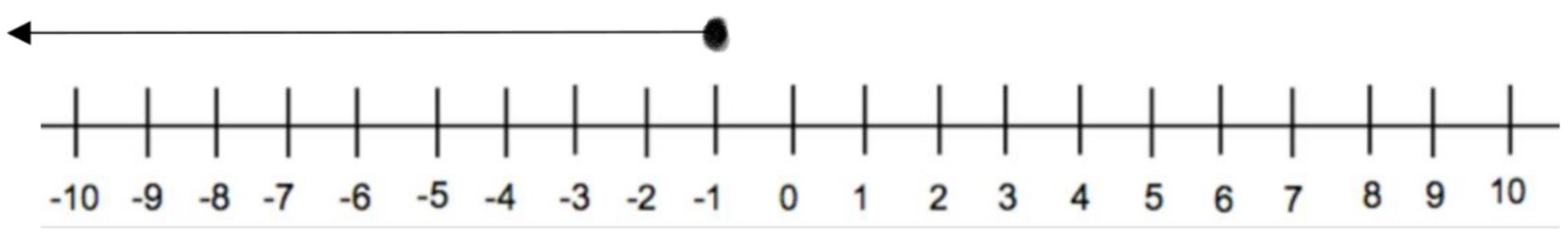
Q1. Shade the inequality $n > -3$ on the number line below.



Answer: _____

(2 marks)

Q2. Write down the inequality illustrated by the number line below:

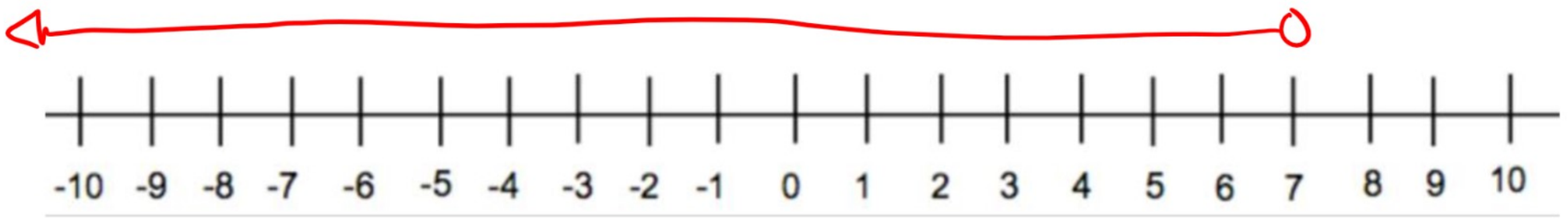


$x \leq -1$

Answer: $x \leq -1$

(2 marks)

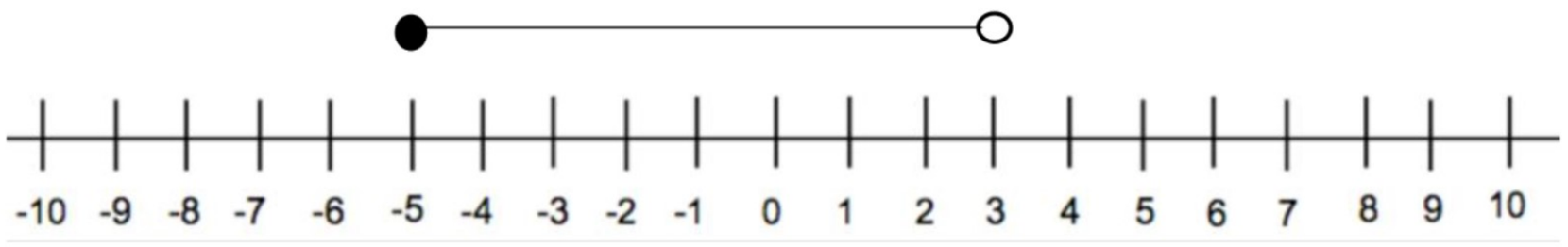
Q3. Shade the inequality $n < 7$ on the number line below.



Answer: _____

(2 marks)

Q4. Write down the inequality illustrated by the number line below:



$-5 \leq x < 3$

Answer: $-5 \leq x < 3$

(2 marks)

Q5. Solve the inequality, $2n > -8$

$n > -4$

Answer: $n > -4$

(2 marks)

Q6. Solve the inequality, $6n - 19 \leq -7$

$6n \leq 12$

$n \leq 2$

Answer: $n \leq 2$

(2 marks)

Q7. Solve the inequality, $5 - 4x > -43$

$48 > 4x$ or $-4x > -48$

$12 > x$ $x < 12$

Answer: $x < 12$

(2 marks)

Q8. Solve the inequality, $5x - 13 < 23 - x$

$6x < 36$

$x < 6$

Answer: $x < 6$

(3 marks)

Q9. Solve the inequality, $5(3x - 4) < 11x - 18$

$15x - 20 < 11x - 18$

$4x < 2$

$x < \frac{1}{2}$

Answer: $x < \frac{1}{2}$

(3 marks)

Q10. Solve the inequality, $\frac{x}{2} - 10 < -6$

$\frac{x}{2} < 4$

$x < 8$

Answer: $x < 8$

(2 marks)

Q11. Solve the inequality, $-54 < \frac{4x}{3} - 10 \leq 14$

$-54 < \frac{4x}{3} - 10$, $\frac{4x}{3} - 10 \leq 14$

$-44 < \frac{4x}{3}$, $\frac{4x}{3} \leq 24$

$-132 < 4x$, $4x \leq 72$

$-32 < x$, $x \leq 18$

$-32 < x \leq 18$

Answer: $-32 < x \leq 18$

(3 marks)

Q12. Find all the integer solutions to the inequality: $-70 \leq 2x + 9 < 27$

$-70 \leq 2x + 9$, $2x + 9 < 27$

$-79 \leq 2x$, $2x < 18$

$-\frac{79}{2} \leq x$, $x < 9$

$-39.5 \leq x < 9$

Answer: $x = -39, -38, \ldots 8$

(4 marks)

Q13. Find all the integer solutions to the inequality: $-4 < \frac{20}{x} > 7$

$-4 < \frac{20}{x}$, $\frac{20}{x} > 7$

$-4x < 20$, $20 > 7x$

$x > -5$, $\frac{20}{7} > x$

$-4, -3, -2, -1, 0, 1, 2$

Answer: $-4, -3, -2, -1, 0, 1, 2$

(3 marks)

Problem Questions:

Q14. Mike sells fruit cakes on a market stall. On each cake he sells, he makes a profit of 70p. His daily stall rent is £8. His daily aim is to make at least £25.

a) Write an inequality to represent this information

let x = no. cakes sold

$0.7x - 8 \geq 25$

$0.7x \geq 33$

Answer: $0.7x \geq 33$

(3 marks)

b) Work out the least amount of cakes which makes need to sell to achieve his daily aim.

$0.7x \geq 33$

$x \geq \frac{33}{0.7}$

$x \geq 47.14\ldots$

or

$\frac{7x}{10} \geq 33$

$7x \geq 330$

$7\overline{)330}$ 47 remainder 1

Answer: 48 cakes

(2 marks)

Q15. Simone needs to buy some pencils and a ruler for school. She can spend no more than £8. The ruler costs £1.20 and the pencils cost 25p each. Let the number of pencils Simone buys be p.

a) Write an inequality for this situation.

$25p + 120 \leq 800$

$25p \leq 680$

Answer: $25p \leq 680$

(2 marks)

b) Solve your inequality in part b) to find the maximum number of pencils she can buy.

$$25 \overline{)\,680} \quad 27 \text{ remainder } 5$$

27 pencils.

Answer: 27 pencils

(2 marks)

Q16. For her holiday, Jane must have at least enough money to pay for 7 nights in a hotel and the flights. The hotel costs £65 per night and the flights cost £310. To save the money she works in a hospital where she earns £18 an hour for day shifts and £24 for night shifts. One third of her hours are night shifts. Let the number of hours Jane works be w.

a) Write an inequality for this situation, simplifying your answer.

. 7 nights & hotel: $7 \times 65 + 310 = 765$

. $\frac{2}{3}w \times 18 + \frac{1}{3}w \times 24 \geq 765$

$12w + 8w \geq 765$

$20w \geq 765$

Answer: $20w \geq 765$

(3 marks)

b) Find the least number of hours Jane will have to work to save the money.

$20w \geq 765$

$w \geq 382.5$ hours

or

(→ 383 hours)

Answer: 383 hours

(2 marks)