Solving Inequalities - Worksheet

Skill

Group A - Unknown on one side

Solve the inequalities below:

1) $3x > 27$

2) $16x \leq 32$

3) $8x > 64$

4) $3x + 2 < 20$

5) $4x + 2 \leq 22$

6) $4x - 4 \geq 12$

7) $4x - 8 \leq 4$

8) $9x - 3 \leq 24$

9) $4(x - 2) < 4$

10) $8(x - 2) < 0$

11) $4(x - 6) \geq 24$

12) $3(x + 3) \leq 12$

Group B - Unknown on both sides

Solve the inequalities below:

1) $3x < x + 10$

2) $5x \leq x + 12$

3) $3x + 10 \leq 8x$

4) $4x > 17 + 3x$

5) $3x + 9 \leq 5x + 3$

6) $2x + 2 < 3x + 5$

7) $4x + 5 \geq 7x - 2$

8) $2x + 22 < 4x + 10$

9) $10 + 5x \geq 22 + x$

10) $4 - x < 7 - 2x$

11) $\frac{x+2}{7} \geq 6 - x$

12) $\frac{x+1}{3} \leq \frac{x-1}{2}$

Group C - Solve and represent on number line

Solve the inequalities below and represent them on a number line.

1) $3x > 12$

2) $8x \leq 24$

3) $9x \geq 81$

4) $6x < 36$

5) $1 + 7x \leq 50$

6) $9x + 4 < 7x + 16$

7) $\frac{x+9}{3} \leq 7$

8) $6 < x + 3 < 10$

9) $4 < 2x \leq 8$

10) $4 < \frac{x}{2} < 6$

11) $16 \leq 5x + 1 \leq 31$

12) $-9 < \frac{x}{4} - 1 < -8$

Solving Inequalities - Worksheet

Applied

1) **(a)** Solve the linear inequality $3 < 2x + 1 \leq 9$

(b) Show the solution on a number line.

(c) List the integer values that satisfy the inequality.

2) **(a)** Solve the linear inequality $1 - 2x < 11$

(b) Show the solution on a number line.

(c) What is the smallest integer that satisfies the inequality?

3) **(a)** A student solved the inequality below. Is the student correct? Why or why not?

$$8 < 2x - 2 \leq 16$$

$$10 < 2x \leq 16$$

$$5 < x \leq 16$$

(b) Solve the linear inequality in (a). Represent the inequality on a number line.

4) Find the range of values of x that satisfies the two inequalities below:
$4(x + 2) \leq 20$
$-6 < 2x < 8$

Solving Inequalities - Exam Questions

1) **(a)** Solve the inequality $2x + 11 \leq 6x - 23$

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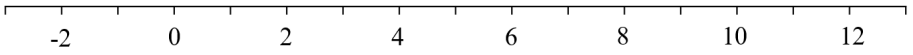
(2)

(b) Show the solution on a number line.



(2)

(4 marks)

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2) **(a)** Solve the inequality:

$$4 < x + 2 \leq 9$$

.....

(2)

(b) List the prime numbers that satisfy the inequality.

.....

(2)

(4 marks)

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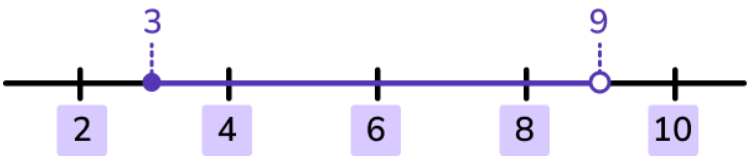
3) **(a)** Write an inequality that satisfies the number line below:



.....

(2)

(b) List the integer values that satisfy the inequality.

.....

(1)

(3 marks)

Solving Inequalities - Exam Questions

4) **(a)** Solve the inequality $3(x + 5) \leq 18$

.....

(2)

(b) What is the greatest integer that satisfies the inequality?

.....

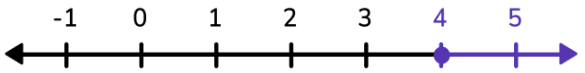
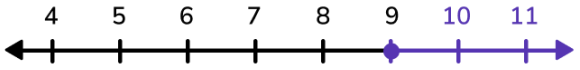
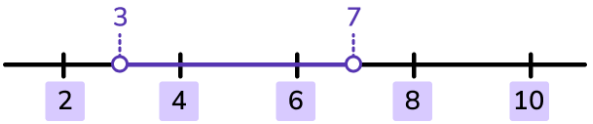
(1)

(3 marks)

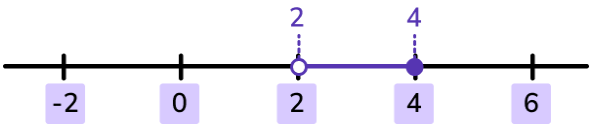
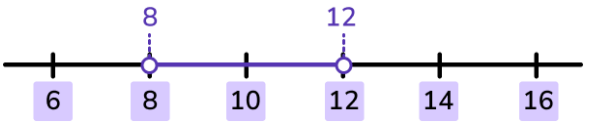
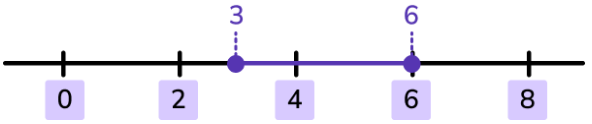
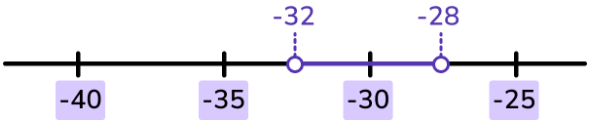
Solving Inequalities - Exam Questions

	Question	Answer
	Skill Questions	
Group A	Solve the inequalities below: **1)** $3x > 27$ **2)** $16x \leq 32$ **3)** $8x > 64$ **4)** $3x + 2 < 20$ **5)** $4x + 2 \leq 22$ **6)** $4x - 4 \geq 12$ **7)** $4x - 8 \leq 4$ **8)** $9x - 3 \leq 24$ **9)** $4(x - 2) < 4$ **10)** $8(x - 2) < 0$ **11)** $4(x - 6) \geq 24$ **12)** $3(x + 3) \leq 12$	**1)** $x > 9$ **2)** $x \leq 2$ **3)** $x > 8$ **4)** $x < 6$ **5)** $x \leq 5$ **6)** $x \geq 4$ **7)** $x \leq 3$ **8)** $x \leq 3$ **9)** $x < 3$ **10)** $x < 2$ **11)** $x \geq 12$ **12)** $x \leq 1$
Group B	Solve the inequalities below: **1)** $3x < x + 10$ **2)** $5x \leq x + 12$ **3)** $3x + 10 \leq 8x$ **4)** $4x > 17 + 3x$ **5)** $3x + 9 \leq 5x + 3$ **6)** $2x + 2 < 3x + 5$ **7)** $4x + 5 \geq 7x - 2$ **8)** $2x + 22 < 4x + 10$ **9)** $10 + 5x \geq 22 + x$ **10)** $4 - x < 7 - 2x$ **11)** $\frac{x+2}{7} \geq 6 - x$ **12)** $\frac{x+1}{3} \leq \frac{x-1}{2}$	**1)** $x < 5$ **2)** $x \leq 3$ **3)** $x \geq 2$ **4)** $x > 17$ **5)** $x \geq 3$ **6)** $x > -3$ **7)** $x \leq \frac{7}{3}$ **8)** $x > 6$ **9)** $x \geq 3$ **10)** $x < 3$ **11)** $x \geq 5$ **12)** $x \geq 5$

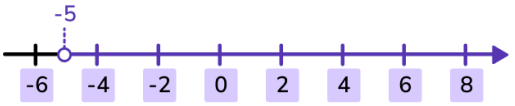
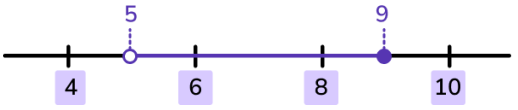
Solving Inequalities - Answers

Group C	Solve the inequalities below and represent them on a number line.	
	1) $3x > 12$	**1)** $x > 4$ 
	2) $8x \leq 24$	**2)** $x \leq 3$ 
	3) $9x \geq 81$	**3)** $x \geq 9$ 
	4) $6x < 36$	**4)** $x < 6$ 
	5) $1 + 7x \leq 50$	**5)** $x \leq 7$ 
	6) $9x + 4 < 7x + 16$	**6)** $x < 6$ 
	7) $\frac{x+9}{3} \leq 7$	**7)** $x \leq 12$ 
	8) $6 < x + 3 < 10$	**8)** $3 < x < 7$ 

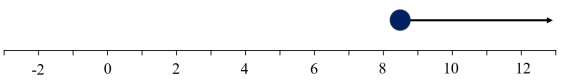
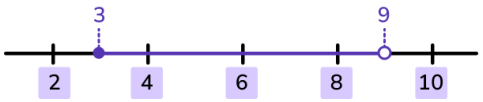
Solving Inequalities - Answers

Group C contd	**9)** $4 < 2x \leq 8$	**9)** $2 < x \leq 4$ 
	10) $4 < \frac{x}{2} < 6$	**10)** $8 < x < 12$ 
	11) $16 \leq 5x + 1 \leq 31$	**11)** $3 \leq x \leq 6$ 
	12) $-9 < \frac{x}{4} - 1 <- 8$	**12)** $-32 < x <- 28$ 

Solving Inequalities - Answers

	Question	Answer
	Applied Questions	
1)	**a)** Solve the linear inequality $3 < 2x + 1 \leq 9$ **b)** Show the solution on a number line. **c)** List the integer values that satisfy the inequality.	**a)** $1 < x \leq 4$ **b)**  **c)** $2,\ 3,\ 4$
2)	**a)** Solve the linear inequality $1 - 2x < 11$ **b)** Show the solution on a number line. **c)** What is the smallest integer that satisfies the inequality?	**a)** $x > -5$ **b)**  **c)** -4
3)	**a)** A student solved the inequality below. Is the student correct? Why or why not? $8 < 2x - 2 \leq 16$ $10 < 2x \leq 16$ $5 < x \leq 16$ **b)** Solve the linear inequality in (a) and represent the inequality on a number line	**a)** No, the student is not correct because when solving the inequality they did not perform the operations on both sides of the inequality, they only did on one side. **b)** $5 < x \leq 9$ 
4)	Find the range of values of x that satisfies the two inequalities below: $4(x + 2) \leq 20$ $-6 < 2x < 8$	$x \leq 3$ and $-3 < x < 5$ Combines to $-3 < x \leq 3$

Solving Inequalities - Answers

	Question	Answer	
	Exam Questions		
1) (a)	Solve the inequality $2x + 11 \geq 6x - 23$	**(a)** $6x - 2x(= 4x)$ **or** $11 + 23(= 34)$ **or** $2x - 6x(= -4x)$ **or** $-23 - 11(= -34)$ $x \geq 8.5$ **oe**	**(1)** **(1)**
(b)	Show the solution on a number line.	**(b)**  For closed circle above 8.5 For arrow in the correct direction	**(1)** **(1)**
2) (a)	Solve the inequality $4 < x + 2 \leq 9$	**(a)** $4 - 2 < x \leq 9 - 2$ $2 < x \leq 7$	**(1)** **(1)**
(b)	List the prime numbers that satisfy the inequality.	**(b)** For identifying the integers 3, 4, 5, 6, 7 For identifying correctly the prime numbers 3, 5, 7	**(1)** **(1)**
3) (a)	Write an inequality that satisfies the number line below:  	**(a)** $3 < x < 9$ $3 \leq x < 9$	**(1)** **(1)**
(b)	List the integer values that satisfy the inequality.	**(b)** 3, 4, 5, 6, 7, 8	**(1)**
4) (a)	Solve the inequality $3(x + 5) \leq 18$	**(a)** $3x + 15 \leq 18$ **or** $x + 5 \leq 6$ $x \leq 1$	**(1)** **(1)**
(b)	What is the greatest integer that satisfies the inequality?	**(b)** 1	**(1)**