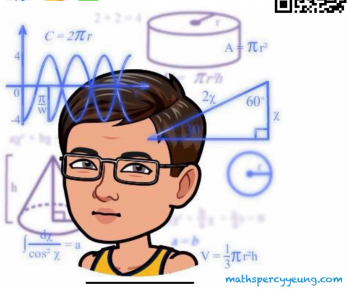


Chapter 8 Inequalities

Multiple Choice Questions

1. Which of the following inequalities is correct?

A. $4 < 3$ B. $\frac{1}{5} < 0$ C. $8 > \frac{1}{8}$ D. $5 > 10$

2. Express the following sentence by using an inequality.
6 is greater than the product of 9 and x.

A. $6 \le 9x$ B. $6 < 9x$ C. $6 > 9x$ D. $6 \ge 9x$

3. Express the following sentence by using an inequality.
The greatest value of x is -15.

A. $x < -15$ B. $x \le -15$ C. $x > -15$ D. $x \ge -15$

4. Express the following sentence by using an inequality.
The product of 2 and y is less than the square of 5.

A. $2y < \sqrt{5}$ B. $2y > \sqrt{5}$ C. $2y < 5^2$ D. $2y > 5^2$

5. Express the following sentence by using an inequality.
Adding 8 to the result of x divided by 3 is not greater than -6.

A. $\frac{x}{3} + 8 \le -6$ B. $\frac{x}{3} + 8 < -6$ C. $\frac{3}{x} + 8 \le -6$ D. $\frac{x}{3} + 8 > -6$

6. Which of the following inequalities has a solution $x = 6$?

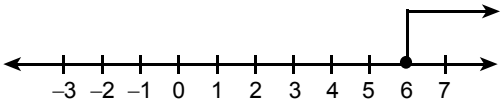
A. $2x \le 8$ B. $2x \ge 14$ C. $3x - 1 < 5$ D. $3x - 1 > 5$

7. Which of the following is a solution of $2x + 3 < 15$?

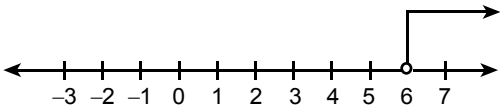
A. $x = 5$ B. $x = 6$ C. $x = 7$ D. $x = 60$

8. Which of the following shows the solutions of $x > 6$ graphical?

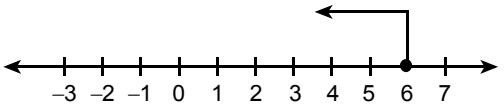
A.



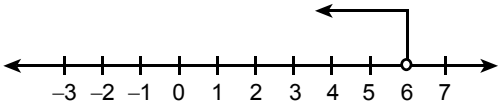
B.



C.

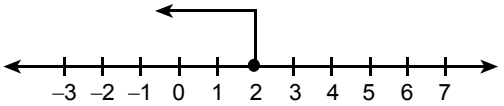


D.

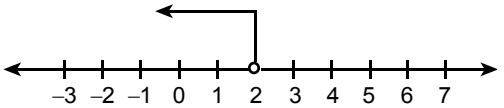


9. Which of the following shows the solutions of $x \leq 2$ graphical?

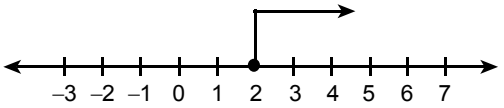
A.



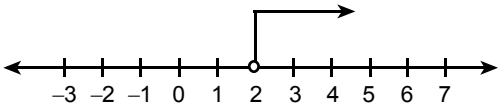
B.



C.



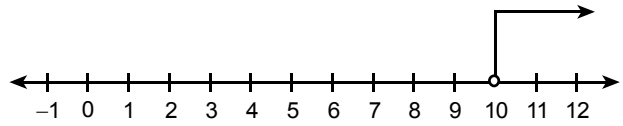
D.



10. Which of the following inequalities does the following figure represent?

A. $x < 5$ B. $x \leq 5$ C. $x > 5$ D. $x \geq 5$

11. Which of the following is a solution of the inequality represented by the following figure?



A. 8 B. 9 C. 10 D. 11

12. Use an appropriate unequal sign to replace □ in the following statement.

If $a \geq b$, then $a + 2$ □ $b + 2$.

A. ≥ B. > C. = D. ≤

13. Which of the following inequalities is equivalent to $x \leq 9$?

A. $x + 7 \leq 2$ B. $x - 7 \leq 2$ C. $x + 3 \leq 3$ D. $x - 3 \geq 12$

14. Use an appropriate unequal sign to replace □ in the following statement.

If $A \leq B$, then $\frac{A}{-5}$ □ $\frac{B}{-5}$.

A. ≥ B. ≤ C. < D. >

15. Use an appropriate unequal sign to replace □ in the following statement.

If $p > q$, then $\frac{1-4p}{5}$ □ $\frac{1-4q}{5}$.

A. ≥ B. ≤ C. < D. >

16. If $p < q$, which of the following inequalities shows the relation between $7p - 2$ and $7q - 2$?

A. $7p - 2 > 7q - 2$ B. $7p - 2 < 7q - 2$

C. $7p - 2 \geq 7q - 2$ D. $7p - 2 \leq 7q - 2$

17. If $-\frac{1}{3p} < -\frac{1}{3q}$, $p > 0$ and $q > 0$, which of the following inequalities shows the relation between p and q?

A. $p < -q$ B. $p > -q$ C. $p < q$ D. $p > q$

18. It is known that $a < b$. If both sides of the inequality are multiplied by –6, and then 7 is subtracted from the products and the differences are divided by 11, then the inequality becomes

A. $\frac{6a+7}{11} < \frac{6b+7}{11}$. B. $\frac{6a-7}{11} < \frac{6b-7}{11}$.

C. $\frac{6a+7}{11} > \frac{6b+7}{11}$. D. $\frac{6a-7}{11} > \frac{6b-7}{11}$.

19. Solve the inequality $7 - 3x < 14$.

A. $x < -\frac{7}{3}$ B. $x > -\frac{7}{3}$ C. $x < \frac{7}{3}$ D. $x > \frac{7}{3}$

20. Solve the inequality $13 - 2x \geq 9$.

A. $x \leq -2$ B. $x \geq -2$ C. $x \leq 2$ D. $x \geq 2$

21. Solve the inequality $\frac{4-3x}{5} > 2$.

A. $x < -2$ B. $x > -2$ C. $x < 2$ D. $x > 2$

22. Solve the inequality $3(x - 2) + 4 < 6x - 5$.

A. $x < -1$ B. $x > -1$ C. $x < 1$ D. $x > 1$

23. Solve the inequality $2(1+\frac{3x}{2}) < \frac{x}{3}$.

A. $x < -\frac{3}{4}$ B. $x > -\frac{3}{4}$ C. $x < \frac{3}{4}$ D. $x > \frac{3}{4}$

24. Subtracting the product of k and 4 by 7 is less than 17, find the greatest integral value of k.

A. 4 B. 5 C. 6 D. 7

25. If 50% of t is not greater than 20, find the greatest integral value of t.

A. 10 B. 39 C. 40 D. 41

26. If $\frac{3}{5}$ times a number is greater than 18, which of the following could be the number?

A. −33 B. 0 C. 30 D. 31

27. It is known that y is an odd number. If $4y - 5 < 39$, find the greatest value of y.

A. 9 B. 10 C. 11 D. 13

28. It is known that x is an even number. If $\frac{-2-x}{3} < 10 + x$, find the least value of x.

A. −4 B. −6 C. −7 D. −8

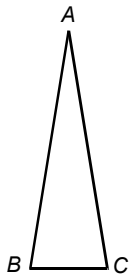
29. If the difference between 60% of a number and 40% of the difference between the number and 30 is greater than 18.5, find the least integral value of that number.

A. 32 B. 32.5 C. 33 D. 34

30. If the sum of two consecutive odd numbers is not smaller than 64, find the least value of the larger number.

A. 29 B. 31 C. 32 D. 33

31. In the figure, ABC is an isosceles triangle with $AB = AC$. The length of AB is less than 4 times the length of BC by 3 cm. If the perimeter of the triangle is not greater than 30 cm, find the greatest possible length of BC.



A. 3 cm B. 4 cm C. 9 cm D. 13 cm

Level 1

1. Express the following sentences by using an inequality.

(a) The product of x and 3 is greater than 8.

(b) Half of y is less than 12.

2. Determine whether each of following is a solution of the inequality $x - 8 > 2$.

(a) 5 **(b)** 14 **(c)** 10 **(d)** -6

3. Determine whether each of the following is a solution of $y + 6 \leq 2$.

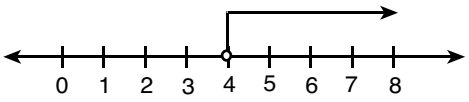
(a) -5 **(b)** 10 **(c)** 0 **(d)** -4

4. Represent the solutions of the following inequalities graphically.

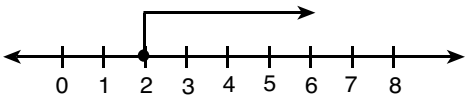
(a) $x \geq 3$ **(b)** $x > 5$ **(c)** $x < 8$ **(d)** $x \leq -2$

5. Write down the inequalities represented by the following figures.

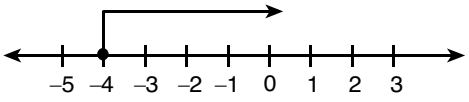
(a)



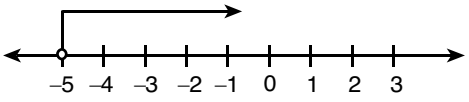
(b)



(c)

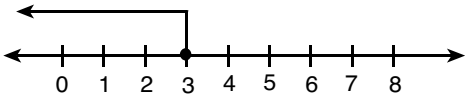


(d)

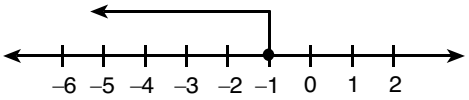


6. Write down the inequalities represented by the following figures.

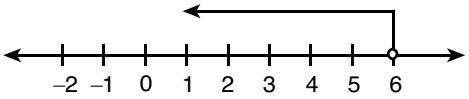
(a)



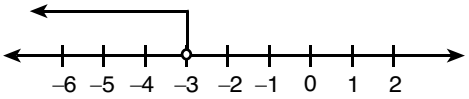
(b)



(c)



(d)



7. Solve the following inequalities.

(a) $x + 10 > 25$ **(b)** $x - 8 > 10$ **(c)** $x + 20 < 50$ **(d)** $x - 12 < 36$

8. Solve the following inequalities.

(a) $y+8>2$ **(b)** $y-5>-7$ **(c)** $y-16<11$ **(d)** $y+15<-18$

9. Solve the following inequalities.

(a) $-x>5$ **(b)** $-y\le 7$ **(c)** $-x\ge -6$ **(d)** $-y<-2$

10. Solve the following inequalities.

(a) $3+x>25$ **(b)** $8-x<1$ **(c)** $12-y\le 7$ **(d)** $-6-y\ge -3$

11. Solve the following inequalities.

(a) $2x\ge 8$ **(b)** $3x<-27$ **(c)** $\frac{2}{3}x>16$ **(d)** $-\frac{6}{5}x\le -12$

12. Solve the following inequalities.

(a) $2x-3\ge 5$ **(b)** $4x+7\le -13$

13. Solve the following inequalities.

(a) $6-2x>16$ **(b)** $14-3x<-19$

14. If x is less than 12, find the greatest integral value of x.

15. If x is greater than -5, find the least integral value of x.

Level 2

16. Solve the following inequalities.

(a) $3(x+2)>15$ **(b)** $-4(x-5)<0$

17. Solve the following inequalities.

(a) $-\frac{2}{3}x+5\ge 2$ **(b)** $-\frac{8}{5}x-12<-7$

18. Solve the following inequalities.

(a) $\frac{1}{5}(x-30)>-4$ **(b)** $-\frac{4}{5}(60-10x)\le 8$

19. Solve the following inequalities.

(a) $11y-23<6y+2$ **(b)** $8y-19\ge 5y-13$

20. Solve the following inequalities.

(a) $\frac{5a-3}{3}\ge \frac{9a+3}{4}$ **(b)** $\frac{6b+2}{7}<\frac{3b+4}{-3}$

21. Solve the inequality $\frac{3}{5}(2y+5)-13\le \frac{y+2}{6}$ and represent the solutions graphically.

22. Solve the inequality $4(8-m)>4-3(2m-5)$ and represent the solutions graphically.

23. Given that $2x-8\ge 17$.

(a) Find the least value of x.

(b) Find the least integral value of x.

24. Given that $\frac{3(x+4)}{2}\le \frac{2(2-3x)}{3}$.

(a) Find the greatest value of x.

(b) Find the greatest integral value of x.

25. Given that $3x > 5x - 12$……(*).

(a) Solve the inequality (*).

(b) Represent the solutions of (*) graphically.

(c) If x is a positive integer, find all possible values of x.

26. The sum of two consecutive even numbers is less than 14, find the greatest values of the two numbers.

27. Teddy has 30 banknotes which include \$20-note and \$50-note. If the total value of the banknotes is greater than \$900, find

(a) the least number of \$50-note.

(b) the greatest number of \$20-note.

28. Eason's examination result is as follows:

Subject	Score
Chinese Language	50
English Language	25
Mathematics	65
Science	55
History	m

If the passing mark is 50, what is the least value of m for him to get a pass in the average mark?

Level 3

29. **(a)** Solve the following inequalities.

(i) $11x - 1 \le 3x + 23$

(ii) $6(3 - x) < 26 - 2x$

(b) If x is an integer and it satisfies both of the inequalities

$$\begin{cases} 11x - 1 \le 3x + 23 \\ 6(3 - x) < 26 - 2x \end{cases},$$

using the result of **(a)**, find all possible values of x.

(c) If x satisfies both of the inequalities

$$\begin{cases} 11x - 1 \le 3x + 23 \\ 6(3 - x) > 26 - 2x \end{cases},$$

find the possible range of x.