Part I

For Exercises 1–8, match each expression in Column A with its corresponding inequality symbol or expression in Column B by writing the <u>letter</u> from Column B that matches the expression in Column A.

	Column A		Column B
$<$ **1.**	is less than	**A.**	$\geq$
$>$ **2.**	is greater than	**B.**	$\leq$
$\leq$ **3.**	is less than or equal to	**C.**	$>$
$\geq$ **4.**	is greater than or equal to	**D.**	$<$
H **5.**	Connie (c) is not as tall as Jose (j). $C < j$	**E.**	$c \geq j$
G **6.**	Cory (c) is older than Janishia (j). $C > j$	**F.**	$c \leq j$
E **7.**	Chris (c) is at least as tall as Julie (j). $C \geq j$	**G.**	$c > j$
F **8.**	Carol (c) is at most the same height as Jane (j).	**H.**	$c < j$

$C \leq j$

Write True or False for each statement.

___T___ **9.** A 13-year-old is at least 10 years old.

___F___ **10.** A 13-year-old is at most 10 years old.

___F___ **11.** A 13-year-old is no less than 20 years old.

___T___ **12.** A 13-year-old is no more than 20 years old.

Part II

Write each phrase in symbols.

1. 8 is less than 12 $8 < 12$

2. 17 is greater than 2 $17 > 2$

3. $12x$ is more than 36 $12x > 36$

4. $15x$ minus 8 is less than 32 $15x - 8 < 32$

5. $10x$ plus 4 is greater than or equal to 15 $10x + 4 \geq 15$

6. $3x$ take away 12 is less than or equal to 21 $3x - 12 \leq 21$

7. $32x$ equals $4x$ more than 12   ~~32x = 4x + 12~~
   $32x = 12 + 4x$

Part III Read the following word problems and **write** and **solve** an inequality for each.

1. The band must earn at least $75 for a trip. Band members already earned $35. Write and solve an inequality to find how much money they still need to earn.

Inequality: $35 + x \geq 75$

Solve:
$$\frac{-35 \qquad\qquad -35}{x \geq 40}$$

Solution: at least $40 more

2. The student council is sponsoring a concert as a fundraiser. Tickets are $3 for students and $5 for adults. The student council wants to raise at least $1000. If 200 students attend, how many adults must attend? Write and solve an inequality.

Inequality: ⑨ $200(3) + 5x \geq 1000$

Solve:
$$600 + 5x \geq 1000$$
$$\frac{-600 \qquad\qquad -600}{\frac{5x}{5} \geq \frac{400}{5}}$$
$$x \geq 80$$

Solution: at least 80

Part IV Solve the following inequalities to answer the code below. Show work on page 4.

This mathematician is best known for developing what is known as fractal geometry. Fractals help describe patterns found in chaotic applications such as stock market fluctuations, weather patterns, and coastline structures.

To reveal this mathematician's name, solve the inequalities. Locate the solution to each inequality in the Answer Code and write the corresponding letter on the blank. Letters may be used more than once.

1. $2x + \frac{2}{3} \geq \frac{-1}{3}$ $\frac{2x}{2} \geq \frac{-6}{2}$ $x \geq -3$

2. $3(x - 7) \leq -21$ $\frac{3x + 21}{3} \leq \frac{-21}{3}$ $3x \leq 0$ $x \leq 0$

3. $-4x + 21 > -3$ $\frac{-21 \quad -21}{\frac{-4x}{-4} > \frac{-24}{-4}}$

$2x - 2 > -3$ 4. $2(x - 1) > -3$ $x < 6$
$\frac{+2 \quad +2}{\frac{2x}{2} > \frac{-1}{2}}$
$x > -\frac{1}{2}$

5. $2.4 \geq 1.2x - 3$ $\frac{5.4 \geq 1.2x}{1.2 \quad 1.2}$ $\boxed{4.5 \geq x}$

6. $\frac{11}{2} \geq 3x - 2$ $\frac{+2}{\frac{15}{2} \geq \frac{3x}{3}}$

7. $x - \frac{15}{2} \geq -2x$ $\frac{5}{2} \cdot \frac{1}{3} = \frac{5}{2}$

$-\frac{15}{2} \geq \frac{-3x}{-3}$
-3
$-\frac{15}{2} \cdot \frac{1}{3} \leq x$
$2\frac{1}{2} \leq x$

8. $6x + 3 < 7 - 2x$ $\frac{5}{2} \geq x$
$\frac{+2x \quad -3 \quad -3 \quad +2x}{\frac{8x}{8} < \frac{4}{8}}$ $x < \frac{1}{2}$

Answer Code

A $x < \frac{1}{2}$
B $x \geq -3$
D $x > 3$
E $x \leq 0$
I $x \leq 4.5$
L $x \leq -6$

9. $5x - 2 < 4(x + 1)$ $x < 6$
$\frac{5x - 2 < 4x + 4}{-4x + 2 \quad -4x + 2}$

10. $3(3x - 1) + 5x > 5(5 + x) - 1$
$9x - 3 + 5x > 25 + 5x - 1$
$14x - 3 > 24 + 5x$
$\frac{-5x + 3 \quad +3 - 5x}{\frac{9x}{9} > \frac{27}{9}}$
$x > 3$

11. $-2(x - 2) \geq 4$ $x \leq 0$
$-2x + 4 \geq 4$

12. $2(x + 4) \leq -3(x + 7) - 1$
$2x + 8 \leq -3x - 21 - 1$

13. $-x \leq 9 + 2x$ $x \geq -3$
$-2x - 3x \leq 9 - 2x$

14. $-19.5 \geq -3(x + 2)$
$-19.5 \geq -3x - 6$

15. $-2(x + 3) < -5$
$-2x - 6 < -5$
$\frac{-2x < 1}{-2}$ $x > -\frac{1}{2}$

16. $-4\left(x - \frac{5}{2}\right) + 2 \geq 2$
$-4x + \frac{5}{2} + 2 \geq 2$
$-4x + 9 \geq 2$
$\frac{2}{-4x \geq \frac{4}{2} - \frac{9}{2}}$
$\frac{-4x}{-4} \geq \frac{-5/2}{-4}$
$x \leq \frac{-5}{2} \cdot \frac{1}{4} = \frac{5}{8}$

$2x + 8 \leq -3x - 22$
$\frac{+3x - 8 \quad +3x - 8}{\frac{5x}{5} \leq \frac{-30}{5}}$
$x \leq 6$

$-13.5 > -3x$
$\frac{-3 \qquad -3}{4.5 \leq x}$

$-4x + 12 \geq 2$
$\frac{-4x \geq -10}{-4}$
$x \leq \frac{5}{2}$

M $x \geq 2\frac{1}{2}$
N $x < 6$
O $x > -\frac{1}{2}$
R $x \geq 4.5$
T $x \leq 2\frac{1}{2}$

B E N O I T   M A N D E L B R O T
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16