

Name _____

Use an inequality and the five-step process to solve the problem.

- 1) One side of a rectangle is 7 inches and the other side is x inches. What values of x will make the perimeter at least 22?
- 2) One side of a rectangle is 11 inches and the other side is x inches. What values of x will make the perimeter at least 40?
- 3) One side of a rectangle is 11 inches and the other side is x inches. What values of x will make the perimeter at most 32?
- 4) One side of a rectangle is 4 inches and the other side is x inches. What values of x will make the perimeter at most 22?
- 5) One side of a rectangle is 2 times the other, and the perimeter is not to exceed 84. Find the possible values for x , the length of the shorter side.
- 6) One side of a rectangle is 2 times the other, and the perimeter is not to exceed 60. Find the possible values for x , the length of the shorter side.
- 7) One side of a triangle is 2 cm shorter than the base, x . The other side is 4 cm longer than the base. What lengths of the base will allow the perimeter of the triangle to be at least 32 cm?
- 8) One side of a rectangle is 16 inches and the other side is x inches. Find the value of x if the area must be at least 208 square inches.
- 9) One side of a rectangle is 10 inches and the other side is x inches. Find the value of x if the area must be at least 150 square inches.
- 10) The area of a triangle must be at most 105 square inches, the base is 15 inches, and the height is x inches. Find the possible values for x .
- 11) The area of a triangle must be at most 28 square inches, the base is 8 inches, and the height is x inches. Find the possible values for x .
- 12) One side of a rectangle is 2 times the other, and the perimeter is not to exceed 72. Find the possible values for x , the length of the shorter side.

Solve.

13) An arrow is fired straight up from the ground with an initial velocity of 192 feet per second. Its height, $s(t)$, in feet at any time t is given by the function $s(t) = -16t^2 + 192t$. Find the interval of time for which the height of the arrow is greater than 252 feet.

14) An arrow is fired straight up from the ground with an initial velocity of 208 feet per second. Its height, $s(t)$, in feet at any time t is given by the function $s(t) = -16t^2 + 208t$. Find the interval of time for which the height of the arrow is greater than 276 feet.

15) The total profit function $P(x)$ for a company producing x thousand units is given by $P(x) = -3x^2 + 42x - 120$. Find the values of x for which the company makes a profit. [Hint: The company makes a profit when $P(x) > 0$.]

16) The total profit function $P(x)$ for a company producing x thousand units is given by $P(x) = -3x^2 + 57x - 234$. Find the values of x for which the company makes a profit. [Hint: The company makes a profit when $P(x) > 0$.]

Use an inequality and the five-step process to solve the problem.

17) In order for a chemical reaction to take place, the Fahrenheit temperature of the reagents must be at least 196.45°F. Find the Celsius temperatures at which the reaction may occur.
 $(F = \frac{9}{5}C + 32)$

18) In order for a chemical reaction to remain stable, its Celsius temperature must be no more than 106.88°C. Find the Fahrenheit temperatures at which the reaction will remain stable. $(F = \frac{9}{5}C + 32)$

19) In order for a chemical reaction to remain stable, its Celsius temperature must be no more than 60.71°C. Find the Fahrenheit temperatures at which the reaction will remain stable. $(F = \frac{9}{5}C + 32)$

20) The equation $y = 0.002x - 0.50$ can be used to determine the approximate profit, y in dollars, of producing x items. How many items must be produced so the profit will be at least \$1308?

21) If the formula $R = -0.037t + 50.1$ can be used to predict the world record in the 400-meter dash t years after 1925, for what years will the world records be 48.3 seconds or less?

22) If the formula $P = 0.5643Y - 1092.57$ can be used to predict the average price of a theater ticket after 1945, for what years will the average theater ticket price be at least 41 dollars? (Y is the actual year.)

Answer Key

Testname: WORKSHEET7.6C_POLYNOMIALINEQUALITYAPPLICATIONS_V02

- 1) $x \geq 4$
- 2) $x \geq 9$
- 3) $0 < x \leq 5$
- 4) $0 < x \leq 7$
- 5) $0 < x \leq 14$
- 6) $0 < x \leq 10$
- 7) $x \geq 16$
- 8) $x \geq 13$
- 9) $x \geq 15$
- 10) $0 < x \leq 14$
- 11) $0 < x \leq 7$
- 12) $0 < x \leq 12$
- 13) between $\frac{5}{2}$ and $\frac{23}{2}$ sec
- 14) between $\frac{3}{2}$ and $\frac{23}{2}$ sec
- 15) x is between 4 thousand units and 10 thousand units
- 16) x is between 6 thousand units and 13 thousand units
- 17) $C \geq 91.36^\circ$
- 18) $F \leq 224.38^\circ$
- 19) $F \leq 141.28^\circ$
- 20) $x \geq 654,250$
- 21) 1974 or after
- 22) 2009 or after