

1. If a measure of the first angle of a triangle is tripled, the result is 22° less than the measure of the second angle and 4° less than the measure of the third angle. What is the measure of the second angle?

let first angle be x
second angle be y

$$3x + 22 = y$$

$$3x + 4 = \text{third angle} = 180^\circ - x - y$$

substitution $3x + 4 = 180^\circ - x - (3x + 22)$

$$x = 22^\circ$$

$$y = 3 \cdot 22^\circ + 22^\circ = \boxed{88^\circ}$$

2. The perimeter of rectangle is 98 inches, and the ratio of the length to width is 4 to 3. What is the length of the rectangle?

$$w \cdot \frac{L}{w} = \frac{4}{3} \cdot w$$

$$3 \cdot L = \frac{4}{3} w \cdot 3$$

$$\frac{3L}{4} = \frac{4w}{4}$$

$$w = \frac{3L}{4}$$

$$2L + 2w = 98$$

$$2L + 2 \cdot \frac{3L}{4} = 98$$

$$3L + 1.5L = 98$$

$$3.5L = 98$$

$$L = \frac{98}{3.5} = \boxed{28 \text{ in}}$$

3. A person paid \$1.47 to make a total of 24 copies on a photocopier. He paid 5 cents per copy of standard sizes and 8 cents per copy for legal sizes. What was the number of standard size copies

	price	# of copies made?	Cost
standard	5¢	x	$0.05x$
legal	8¢	$24 - x$	$0.08(24 - x)$
mix			1.47

$$0.05x + 0.08(24 - x) = 1.47$$

$$0.05x + 1.92 - 0.08x = 1.47$$

$$1.92 - 0.03x = 1.47$$

$$-0.03x = -0.45$$

$$x = \frac{-0.45}{-0.03} = \frac{45}{3} = \boxed{15}$$

4. A person spends \$54.60 for an item. This amount represents a 20% discount from the original selling price, but it includes a 5% sales tax. What was the original price?

let original price be x

$$54.6 = 80\%x + 5\%(x \cdot 80\%)$$

$$54.6 = 0.8x + 0.05x \cdot 0.8$$

$$0.84x = 54.6$$

$$x = \frac{54.6}{0.84} = \boxed{\$65}$$

5. Race cars C and D left the starting line at the same instant and drove around a one-mile track. Car C averaged 162 MPH and car D averaged 170 MPH. When car D completed the tenth lap, how far behind, to the nearest hundredth mile, was car C?

	speed	distance	time
C	162	$10x$	$\frac{162}{10}x$
D	170	10	$\frac{170}{10}$

$$X = \frac{10 \cdot 170}{162} =$$

$$\frac{162}{x} = \frac{170}{10}$$

$$x = \frac{1620}{170} \approx 9.529$$

$$10 - 9.529 = \boxed{0.47 \text{ miles}}$$

6. How many cubic centimeters of pure water must be added to 20 cubic centimeters of a 40% HCL solution to dilute the solution to 32% HCL?

	concentration	Volume	Pure
40% HCL	40%	20	$0.4 \cdot 20$
32% HCL	32%	$20+x$	$0.32(20+x)$

$$0.4 \cdot 20 = 0.32(20+x)$$

$$8 = 6.4 + 0.32x$$

$$0.32x = 1.6$$

$$x = \frac{1.6}{0.32} = \boxed{5 \text{ cubic centimeters}} \\ \text{cm}^3$$

7. Solve $-5 \leq 2x+9 < 3$

$$\begin{array}{r} \rightarrow 9 \quad -9 \quad -9 \\ -5 \leq 2x+9 < 3 \end{array}$$

$$-14 \leq 2x < -6$$

$$-7 \leq x < -3$$

$$\boxed{-7 \leq x < -3}$$

$$\boxed{[-7, -3)}$$

8. Solve $3x-15 > -3(1-x)$

$$\begin{array}{r} 3x-15 > -3+3x \\ -3x \quad \quad -3x \end{array}$$

$$-15 > -3$$

always false

\therefore $\boxed{\text{No solution}}$

9. Solve $\left(\frac{3}{4}x - \frac{2}{3}\right) < \left(\frac{1}{2}x - \frac{5}{6}\right)$. 12

$$9x - 8x < 6x - 10$$

$$x < 6x - 10$$

$$-6x - 6x$$

$$-5x < -10$$

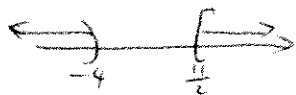
$$\boxed{x > 2}$$

10. Determine the solution set of $2x - 4 \geq 7$ and $3x + 8 < -4$

$$2x \geq 7 + 4 \quad \text{and} \quad 3x < -12$$

$$2x \geq 11 \quad x < -4$$

$$x \geq \frac{11}{2} \quad \text{and} \quad x < -4$$



No overlaps

$\therefore \boxed{\emptyset}$ No solution

11. Determine the solution set of $\frac{1}{3}x + \frac{1}{2} \geq \frac{1}{6}$ and $\frac{1}{6}x - \frac{1}{3} \leq -\frac{1}{6}$

$$6\left(\frac{1}{3}x + \frac{1}{2}\right) \geq \frac{1}{6} \cdot 6 \quad 6\left(\frac{1}{6}x - \frac{1}{3}\right) \leq \left(-\frac{1}{6}\right) \cdot 6$$

$$2x + 3 \geq 1$$

$$x - 2 \leq -1$$

$$2x \geq -2$$

$$x \leq 1$$

$$x \geq -1$$



$\therefore \boxed{x \in [-1, 1]}$

12. Solve $|x - 6| = 15$

$$x - 6 = 15 \quad \text{or} \quad x - 6 = -15$$

$$\boxed{x = 21 \quad \text{or} \quad x = -9}$$

13. Solve $|1 + 2x| = |2 + 3x|$

$$1 + 2x = 2 + 3x \quad \text{or} \quad 1 + 2x = -(2 + 3x)$$

$$1 = 2 + x \quad \text{or} \quad 1 + 2x = -2 - 3x$$

$$x = -1$$

$$1 + 5x = -2$$

$$5x = -3$$

$$\boxed{x = -1 \quad \text{or} \quad x = -\frac{3}{5}}$$

14. Solve $|4x + 2| \geq 2$

$$4x + 2 \geq 2 \quad \text{or} \quad 4x + 2 \leq -2$$

$$4x \geq 0 \quad \text{or} \quad 4x \leq -4$$

$$x \geq 0$$

$$x \leq -1 \quad \therefore (-\infty, -1] \cup [0, \infty)$$



15. Solve $|x - 2| \leq 4$

$$-4 \leq x - 2 \leq 4$$

$$\boxed{-2 \leq x \leq 6}$$