

1. Give **one example** of each of the following: (**5** /5)

(a) Expression

$-3ab - 4$ ✓

(b) Equation that is Solved for the Unknown

$x+1=2$ ✓

(c) Equation that Expresses a Mathematical Relationship

$V=lwh$ ✓

(d) Identity

$1=1, 2=2, x=x, 3x+2x=5x, \text{etc}$ ✓

(e) A Value that Satisfies the Equation $x^2 = 100$

$x=10$ or $x=-10$ ✓

2. For the given equation, complete the flowchart, solve the equation by performing operations to **both sides** and check your solution. (**8** /8)

Equation	Flowchart	Solve the Equation by Performing Operations to B.S.	Check your Solution	
(a) $3(x+6) = -81$		$3(x+6) = -81$	L.H.S.	R.H.S.
		$\therefore 3x+18 = -81$ ✓	$3(x+6)$	-81
		$\therefore 3x+18-18 = -81-18$ ✓	$= 3(-33+6)$	
		$\therefore 3x = -99$	$= 3(-27)$	
		$\therefore \frac{3x}{3} = \frac{-99}{3}$ ✓	$= -81$ ✓	
		$\therefore x = -33$ ✓	Since L.H.S. = R.H.S., $x = -33$ is the solution to the given equation.	

3. Solve the given equation by performing operations to both sides. (**7** /7)

$-13(-2z-3) - (15z+4) = -3 - (4-3z) - 7(3z-2)$

$\therefore 26z+39-15z-4 = -3-4+3z-21z+14$ ✓

$\therefore 26z-15z+39-4 = 3z-21z-3-4+14$

$\therefore 11z+35 = -18z+7$ ✓

$\therefore 11z+35+18z = -18z+7+18z$ ✓

$\therefore 29z+35 = 7$

$\therefore 29z+35-35 = 7-35$ ✓

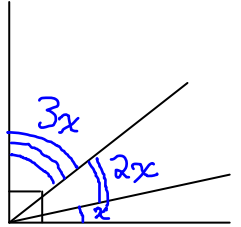
$\therefore 29z = -28$

$\therefore \frac{29z}{29} = \frac{-28}{29}$ ✓

$\therefore z = -\frac{28}{29}$ ✓

4. Two or more angles are complementary if their sum is 90° . In the diagram at the right, three angles are complementary. One angle is **double the smallest angle**. The largest angle is **triple the smallest angle**. **Use an equation** to find the measures of each angle. (6/6)

Let x represent the measure of the smallest angle. Then the other two angles can be represented by $2x$ and $3x$



The sum of the three angles is 90°

$$x + 2x + 3x = 90$$

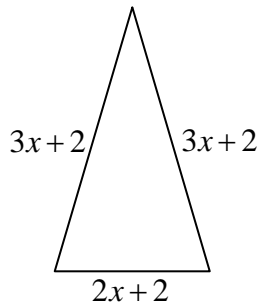
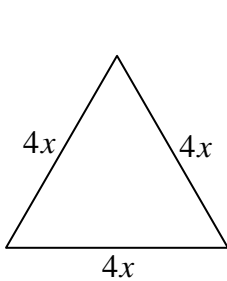
$$\therefore 6x = 90$$

$$\therefore \frac{6x}{6} = \frac{90}{6}$$

$$\therefore x = 15$$

The angle measures are 15° , 30° and 45° .

5. The triangles shown below have the same perimeter. **Use an equation** to find the side lengths of each triangle. (6/6)



The perimeter of the equilateral triangle is the same as the perimeter of the isosceles triangle

$$4x + 4x + 4x = 3x + 2 + 3x + 2 + 2x + 2 \quad (\text{collect like terms and simplify})$$

$$\therefore 12x = 8x + 6$$

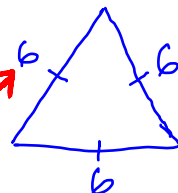
$$\therefore 12x - 8x = 8x + 6 - 8x$$

$$\therefore 4x = 6$$

$$\therefore \frac{4x}{4} = \frac{6}{4}$$

$$\therefore x = \frac{3}{2} = 1.5$$

Therefore the side lengths are as summarized below:



$$P = 6 + 6 + 6 = 18$$

$$\begin{aligned} 4x &= 4(1.5) \\ &= 6 \end{aligned}$$



$$P = 6.5 + 6.5 + 5 = 18$$

$$2x + 2 = 2(1.5) + 2 = 5$$

$$\begin{aligned} 3x + 2 &= 3(1.5) + 2 \\ &= 4.5 + 2 \\ &= 6.5 \end{aligned}$$