MPM1D9 Unit 2: Review Quiz **Victim:** Mr Solutions

Well done Mr. S. !!

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

(a) Expression $3x+4$ ✓

(b) Equation that is Solved for the Unknown $3x+4=7$ ✓

(c) Equation that Expresses a Mathematical Relationship $A=2\pi r^2+2\pi rh$ ✓

(d) Identity $x+x=2x$ ✓

(e) A Value that Satisfies the Equation $x^2=64$ $x=8$ or $x=-8$ ✓

2. For the given equation, complete the flowchart, solve the equation by performing operations to ***both sides*** and check your solution. (10 /10)

Equation	***Flowchart***	***Solve the Equation by Performing Operations to B.S.***	***Check your Solution***
(a) $\frac{3}{2}x+\frac{1}{2}=\frac{3}{4}$	x → $\times\frac{3}{2}$ → $+\frac{1}{2}$ → $\frac{3}{4}$; $\frac{1}{6}$ ← $\div\frac{3}{2}$ ✓ ← $-\frac{1}{2}$ ← $\frac{3}{4}$	$\frac{3}{2}x+\frac{1}{2}=\frac{3}{4}$ ✓ $\therefore \frac{4}{1}\left(\frac{3}{2}x\right)+\frac{4}{1}\left(\frac{1}{2}\right)=\frac{4}{1}\left(\frac{3}{4}\right)$ $\therefore \frac{12}{2}x+\frac{4}{2}=\frac{12}{4}$ $\therefore 6x+2=3$ ✓ $\therefore 6x+2-2=3-2$ ✓ $\therefore 6x=1$ $\therefore \frac{6x}{6}=\frac{1}{6}$ ✓ $\therefore x=\frac{1}{6}$ ✓	L.H.S. / R.H.S. $\frac{3}{2}x+\frac{1}{2}$ / $\frac{3}{4}$ $=\frac{3}{2}\left(\frac{1}{6}\right)+\frac{1}{2}$ $=\frac{3\div 3}{12\div 3}+\frac{1}{2}$ $=\frac{1}{4}+\frac{1\times 2}{2\times 2}$ $=\frac{1}{4}+\frac{2}{4}$ $=\frac{3}{4}$ ✓✓ Since L.H.S. = R.H.S., $x=\frac{1}{6}$ is the solution

Rough Work:

$\frac{3}{4}-\frac{1}{2}=\frac{3}{4}-\frac{2}{4}=\frac{1}{4}$

$\frac{1}{4}\div\frac{3}{2}=\frac{1}{4}\times\frac{2}{3}$

$=\frac{2}{12}=\frac{1}{6}$

3. Solve the given equation by performing operations to both sides. (9 /9)

$\frac{1}{4}(2y-7)+\frac{y-5}{6}=-3-(5y-8)$ Multiply B.S. by LCD → 12

$\therefore \frac{12}{1}\left[\frac{1}{4}(2y-7)\right]+\frac{12}{1}\left(\frac{y-5}{6}\right)=12(-3)-12(5y-8)$ ✓

$\therefore \frac{12}{4}(2y-7)+\frac{12}{6}(y-5)=-36-60y+96$

$\therefore 3(2y-7)+2(y-5)=-60y-36+96$ ✓

$\therefore 6y-21+2y-10=-60y+60$ ✓

$\therefore 8y-31=-60y+60$ ✓

$\therefore 8y-31+60y=-60y+60+60y$ ✓

$\therefore 68y-31=60$

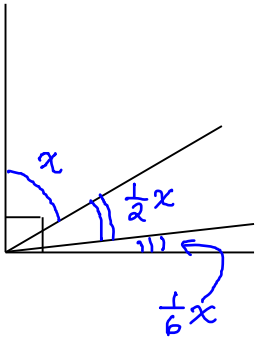
$\therefore 68y-31+31=60+31$ ✓

$\therefore 68y=91$

$\therefore \frac{68y}{68}=\frac{91}{68}$ ✓

$\therefore y=\frac{91}{68}$ ✓

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 ***one-half*** of the largest angle. The smallest angle is ***one-sixth*** of the largest angle. ***Use an equation*** to find the measure of each angle. (**7** /7)



Let x represent the measure of the largest angle. Then the other angles can be represented by $\frac{1}{2}x$ and $\frac{1}{6}x$.

Sum of the angles is 90°

$$x+\tfrac{1}{2}x+\tfrac{1}{6}x = 90$$

$$\therefore 6x+\tfrac{6}{1}\left(\tfrac{1}{2}x\right)+\tfrac{6}{1}\left(\tfrac{1}{6}x\right) = 6(90)$$

$$\therefore 6x+\tfrac{6}{2}x+\tfrac{6}{6}x = 540$$

$$\therefore 6x+3x+1x = 540$$

$$\therefore 10x = 540$$

$$\therefore \frac{10x}{10} = \frac{540}{10}$$

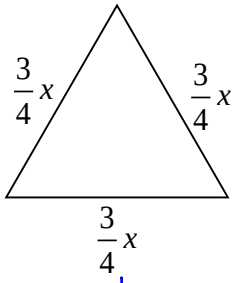
$$\therefore x = 54$$

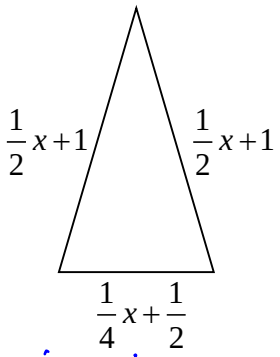
$$\therefore \tfrac{1}{2}x = \tfrac{1}{2}(54) = 27$$

and $\frac{1}{6}x = \frac{1}{6}(54) = 9$

The angle measures are 9°, 27° and 54°.

5. The triangles shown below have the ***same perimeter***. ***Use an equation*** to find the side lengths of each triangle. (**10** /10)





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

$$\tfrac{3}{4}x+\tfrac{3}{4}x+\tfrac{3}{4}x = \tfrac{1}{2}x+1+\tfrac{1}{2}x+1+\tfrac{1}{4}x+\tfrac{1}{2}$$

$$\therefore \tfrac{9}{4}x = \tfrac{2}{4}x+\tfrac{2}{4}x+\tfrac{1}{4}x+\tfrac{2}{2}+\tfrac{2}{2}+\tfrac{1}{2}$$

$$\therefore \tfrac{9}{4}x = \tfrac{5}{4}x+\tfrac{5}{2}$$

$$\therefore \tfrac{4}{1}\left(\tfrac{9}{4}x\right) = \tfrac{4}{1}\left(\tfrac{5}{4}x\right)+\tfrac{4}{1}\left(\tfrac{5}{2}\right)$$

$$\therefore 9x = 5x+10$$

$$\therefore 9x-5x = 5x+10-5x$$

$$\therefore 4x = 10$$

$$\therefore \frac{4x}{4} = \frac{10\div 2}{4\div 2}$$

$$\therefore x = \frac{5}{2} = 2.5$$

Equilateral Triangle Side Lengths:

$$\tfrac{3}{4}x = \tfrac{3}{4}\left(\tfrac{5}{2}\right) = \tfrac{15}{8}$$

Isosceles Triangle Side Lengths:

Equal Sides: $\frac{1}{2}x+1 = \frac{1}{2}\left(\frac{5}{2}\right)+1 = \frac{5}{4}+\frac{4}{4} = \frac{9}{4}$

Third Side: $\frac{1}{4}x+\frac{1}{2} = \frac{1}{4}\left(\frac{5}{2}\right)+\frac{1}{2} = \frac{5}{8}+\frac{4}{8} = \frac{9}{8}$