

SOLUTIONS FOR S.4 MATH WORKSHEET THREE

1. Simplify the following expressions

<p>(a) $\frac{m+1}{2} + \frac{m-3}{2}$ $= \frac{m+1+m-3}{2}$ $= \frac{m+m+1-3}{2}$ $= \frac{2m-2}{2}$ $= \frac{2(m-1)}{2}$ $= m-1$ ✓</p>	<p>(b) $\frac{2w+1}{2} - \frac{6w-2}{4}$ $= \frac{2(2w+1) - 1(6w-2)}{4}$ $= \frac{4w+2-6w+2}{4}$ $= \frac{4w-6w+2+2}{4}$ $= \frac{-2w+4}{4}$ $= \frac{4}{4}(-w+2)$ $= \frac{-w+2}{2} \text{ or } \frac{2-w}{2}$ ✓</p>
<p>(c) $\frac{y+6}{5} + \frac{2y-5}{15}$ $= \frac{3(y+6) + 1(2y-5)}{15}$ $= \frac{3y+18+2y-5}{15}$ $= \frac{3y+2y+18-5}{15}$ $= \frac{5y+13}{15}$ ✓</p>	<p>(d) $\frac{5-2n}{4} + \frac{3p-1}{2}$ $= \frac{5-2n+2(3p-1)}{4}$ $= \frac{5-2n+6p-2}{4}$ $= \frac{6p-2n+5-2}{4}$ $= \frac{6p-2n+3}{4}$ ✓</p>
<p>(e) $\frac{3x+4}{11} + \frac{2x}{33}$ $= \frac{3(3x+4) + 1 \times 2x}{33}$ $= \frac{9x+12+2x}{33}$ $= \frac{9x+2x+12}{33}$ $= \frac{11x+12}{33}$ ✓</p>	<p>(f) $\frac{v}{2} - \frac{v+1}{4}$ $= \frac{2 \times v - 1(v+1)}{4}$ $= \frac{2v - v - 1}{4}$ $= \frac{v-1}{4}$ ✓</p>
<p>(g) $x + 2a - \frac{3x-1}{4} - \frac{2a}{5}$ $= \frac{x}{1} + \frac{2a}{1} - \frac{3x-1}{4} - \frac{2a}{5}$ $= \frac{20 \times x + 20 \times 2a - 5(3x-1) - 4 \times 2a}{20}$ $= \frac{20x + 40a - 15x + 5 - 8a}{20}$ $= \frac{40a - 8a + 20x - 15x}{20}$ $= \frac{32a + 5x + 5}{20}$ ✓</p>	<p>(h) $\frac{x-1}{2} - \frac{1}{3} + \frac{x}{3}$ $= \frac{3(x-1) - 2 \times 1 + 2 \times x}{6}$ $= \frac{3x-3-2+2x}{6}$ $= \frac{3x+2x-3-2}{6}$ $= \frac{5x-5}{6}$ $= \frac{5(x-1)}{6} \text{ or } \frac{5}{6}(x-1)$ ✓</p>
<p>(i) $\frac{4a}{7} + \frac{3a+5}{2} - \frac{3(a+2)}{14}$ $= \frac{4a}{7} + \frac{3a+5}{2} - \frac{3(a+2)}{14}$ $= \frac{2 \times 4a + 7(3a+5) - 3(a+2)}{14}$ $= \frac{8a + 21a + 35 - 3a - 6}{14}$ $= \frac{29a - 3a + 35 - 6}{14}$ $= \frac{26a + 29}{14}$</p>	<p>(j) $\frac{3p}{12} - \left(\frac{p}{2} - \frac{p}{4} + \frac{5p}{6} \right)$ $= \frac{3p}{12} - \left(\frac{6 \times p - 3 \times p + 2 \times 5p}{12} \right)$ $= \frac{3p}{12} - \left(\frac{6p - 3p + 10p}{12} \right)$ $= \frac{3p}{12} - \left(\frac{13p}{12} \right)$ $= \frac{3p}{12} - \left(\frac{13p}{12} \right)$</p>

$= \frac{15a + 7}{14}$	$= \frac{3p - 13p}{12}$ $= \frac{-10p}{12}$ $= -\frac{5p}{6}$
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2. Solve the following equations

<p>(a) $\frac{5x+2}{3} - \frac{7x+2}{5} = 2$</p> $15 \times \frac{5x+2}{3} - \frac{7x+2}{5} \times 15 = 2 \times 15$ $5(5x+2) - 3(7x+2) = 30$ $25x + 10 - 21x - 6 = 30$ $25x - 21x + 10 - 6 = 30$ $4x + 4 = 30$ $4x = 30 - 4$ $4x = 26$ $\frac{4x}{4} = \frac{26}{4}$ $x = \frac{13}{2}$ $x = 6\frac{1}{2}$	<p>(b) $\frac{3}{4}(2a+1) = \frac{5}{6}(a+5)$</p> $12 \times \frac{3}{4}(2a+1) = \frac{5}{6}(a+5) \times 12$ $3 \times 3(2a+1) = 2 \times 5(a+5)$ $9(2a+1) = 10(a+5)$ $18a + 9 = 10a + 50$ $18a - 10 = 50 - 9$ $8a = 50 - 9$ $8a = 41$ $\frac{8a}{8} = \frac{41}{8}$ $a = 5\frac{1}{8}$
<p>(c) $\frac{n-1}{2} - \frac{n-3}{4} = \frac{1}{2}$</p> $4 \times \frac{n-1}{2} - \frac{n-3}{4} \times 4 = \frac{1}{2} \times 4$ $2(n-1) - 1(n-3) = 1 \times 2$ $2n - 2 - n + 3 = 2$ $2n - n - 2 + 3 = 2$ $n + 1 = 2$ $n = 2 - 1$ $n = 1$	<p>(d) $\frac{2}{2} - \frac{x+1}{4} = \frac{x}{3} + 2$</p> $12 \times \frac{2}{2} - \frac{x+1}{4} \times 12 = \frac{x}{3} \times 12 + 2 \times 12$ $6 \times 2 - 3(x+1) = x \times 4 + 24$ $12 - 3x - 3 = 4x + 24$ $12 - 3 - 3x = 4x + 24$ $9 - 3x = 4x + 24$ $-3x - 4x = 24 - 9$ $-7x = 15$ $\frac{-7x}{-7} = \frac{15}{-7}$ $x = -\frac{15}{7}$ $x = -2\frac{1}{7}$
<p>(e) $\frac{n+1}{2} - \frac{n-3}{4} = \frac{n+2}{3}$</p> $12 \times \frac{n+1}{2} - \frac{n-3}{4} \times 12 = \frac{n+2}{3} \times 12$ $6(n+1) - 3(n-3) = 4(n+2)$ $6n + 6 - 3n + 9 = 4n + 8$ $6n - 3n + 6 + 9 = 4n + 8$ $3n + 15 = 4n + 8$ $3n - 4n = 8 - 15$ $-n = -7$ $\frac{-n}{-1} = \frac{-7}{-1}$ $n = 7$	<p>(f) $\frac{4p-1}{3} - \frac{3p-1}{2} = \frac{5-2p}{4}$</p> $12 \times \frac{4p-1}{3} - \frac{3p-1}{2} \times 12 = \frac{5-2p}{4} \times 12$ $4(4p-1) - 6(3p-1) = 3(5-2p)$ $16p - 4 - 18p + 6 = 15 - 6p$ $16p - 18p - 4 + 6 = 15 - 6p$ $-2p + 2 = 15 - 6p$ $-2p + 6p = 15 - 2$ $4p = 13$ $\frac{4p}{4} = \frac{13}{4}$ $p = \frac{13}{4}$ $p = 3\frac{1}{4}$

$$(g) \frac{1}{5}(w+6) - \frac{1}{15}(2w-5) = \frac{1}{3}(1-w)$$

$$15 \times \frac{1}{5}(w+6) - \frac{1}{15}(2w-5) \times 15 = \frac{1}{3}(1-w) \times 15$$

$$3(w+6) - (2w-5) = 5(1-w)$$

$$3w + 18 - 2w + 5 = 5 - 5w$$

$$3w - 2w + 18 + 5 = 5 - 5w$$

$$w + 23 = 5 - 5w$$

$$w + 5w = 5 - 23$$

$$6w = -18$$

$$\frac{6w}{6} = \frac{-18}{6}$$

$$w = -3$$

$$(h) \frac{1}{2} - \frac{x}{6} = -\frac{5}{2}$$

$$6 \times \frac{1}{2} - \frac{x}{6} \times 6 = -\frac{5}{2} \times 6$$

$$3 \times 1 - x \times 1 = -5 \times 3$$

$$3 - x = -15$$

$$-x = -15 - 3$$

$$-x = -18$$

$$\frac{-x}{-1} = \frac{-18}{-1}$$

$$x = 18$$

$$(i) \frac{4p-1}{3} - \frac{3p-1}{2} = 1$$

$$6 \times \frac{4p-1}{3} - \frac{3p-1}{2} \times 6 = 1 \times 6$$

$$2(4p-1) - 3(3p-1) = 6$$

$$8p - 2 - 9p + 3 = 6$$

$$8p - 9p - 2 + 3 = 6$$

$$-p + 1 = 6$$

$$-p = 6 - 1$$

$$-p = 5$$

$$\frac{-p}{-1} = \frac{5}{-1}$$

$$p = -5$$

$$(j) \frac{x+1}{3} + \frac{x-4}{2} = 5$$

$$6 \times \frac{x+1}{3} + \frac{x-4}{2} \times 6 = 5 \times 6$$

$$2(x+1) + 3(x-4) = 30$$

$$2x + 2 + 3x - 12 = 30$$

$$2x + 3x + 2 - 12 = 30$$

$$5x - 10 = 30$$

$$5x = 30 + 10$$

$$5x = 40$$

$$\frac{5x}{5} = \frac{40}{5}$$

$$x = 8$$

END.