

# Mr. Ward Answer Key

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$$2. \frac{1}{8} + \frac{2}{t} = \frac{17}{8t}$$

$$\frac{1}{8} (8t) + \frac{2}{t} (8t) = \frac{17}{8t} (8t)$$

$$t + 16 = 17$$

$$\boxed{t = 1}$$

$$3. 7 = \frac{1}{w} - 4$$

$$7(w) = \frac{1}{w} (w) - 4(w)$$

$$7w = 1 - 4w$$

$$11w = 1$$

$$\boxed{w = \frac{1}{11}}$$

$$4. \frac{1}{r-5} = \frac{7}{2r}$$

$$7(r-5) = 2r$$

$$7r - 35 = 2r$$

$$5r = 35$$

$$\boxed{r = 7}$$

$$5. \frac{1}{x} = \frac{x}{6} - \frac{5}{6}$$

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

$$6 = x^2 - 5x$$

$$0 = x^2 - 5x - 6$$

$$0 = (x-6)(x+1)$$

$$\boxed{x = 6, -1}$$

$$6. m + \frac{12}{m} = 7$$

$$m(m) + \frac{12}{m} (m) = 7(m)$$

$$m^2 + 12 = 7m$$

$$m^2 - 7m + 12 = 0$$

$$(m-4)(m-3) = 0$$

$$\boxed{m = 4, 3}$$

$$7. k + \frac{1}{k} = 2$$

$$k(k) + \frac{1}{k} (k) = 2(k)$$

$$k^2 + 1 = 2k$$

$$k^2 - 2k + 1 = 0$$

$$(k-1)(k-1) = 0$$

$$\boxed{k = 1}$$

$$8. \frac{-2x}{x+2} + \frac{x}{3} = \frac{4}{x+2}$$

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

$$-6x + x^2 + 2x = 12$$

$$x^2 - 4x - 12 = 0$$

$$(x-6)(x+2) = 0$$

$$\boxed{x = 6, -2 ; x = -2 \text{ is extraneous}}$$

$$9. \frac{x}{x-3} + \frac{x}{2} = \frac{6x}{2x-6}$$

$$\frac{x}{x-3} + \frac{x}{2} = \frac{6x}{2(x-3)}$$

$$\frac{x(2(x-3))}{x-3} + \frac{x(2(x-3))}{2} = \frac{6x(2(x-3))}{2(x-3)}$$

$$2x + x^2 - 3x = 6x$$

$$x^2 - x = 6x$$

$$x^2 - 7x = 0$$

$$x(x-7) = 0$$

$$x = 0, 7$$

$$10. \frac{3}{x(x+1)} - 1 = \frac{3}{x^2+x}$$

$$\frac{3}{x(x+1)} - 1 = \frac{3}{x(x+1)}$$

$$\frac{3(x(x+1))}{x(x+1)} - 1(x(x+1)) = \frac{3(x(x+1))}{x(x+1)}$$

$$3 - (x^2 + x) = 3$$

$$-x^2 - x = 0$$

$$-x(x+1) = 0$$

$x = 0, -1$ ;  $x = 0, -1$  are both extraneous solutions

$$19. 4 + \frac{1}{x} = \frac{10}{2x}$$

$$4(2x) + \frac{1(2x)}{x} = \frac{10(2x)}{2x}$$

$$8x + 2 = 10$$

$$8x = 8$$

$$x = 1$$

$$20. \frac{5}{4} = \frac{n-3}{n-4}$$

$$4(n-3) = 5(n-4)$$

$$4n - 12 = 5n - 20$$

$$-4n + 20 = -4n + 20$$

$$8 = n$$

$$21. \frac{1}{a-7} = \frac{3}{a}$$

$$3(a-7) = 1$$

$$3a - 21 = 1$$

$$3a = 22$$

$$a = \frac{22}{3}$$

$$22. \frac{1}{x} - \frac{3}{4} = \frac{x}{4}$$

$$\frac{1(4x)}{x} - \frac{3(4x)}{4} = \frac{x(4x)}{4}$$

$$4 - 3x = x^2$$

$$x^2 + 3x - 4 = 0$$

$$(x+4)(x-1) = 0$$

$$x = -4, 1$$

$$23. \frac{14}{z} = 9-z$$

$$z(9-z) = 14$$

$$9z - z^2 = 14$$

$$z^2 - 9z + 14 = 0$$

$$(z-7)(z-2) = 0$$

$$z = 7, 2$$

$$24. x + \frac{4}{x} = 4$$

$$x(x) + \frac{4(x)}{x} = 4(x)$$

$$x^2 + 4 = 4x$$

$$x^2 - 4x + 4 = 0$$

$$(x-2)(x-2) = 0$$

$$x = 2$$

$$25. \frac{4x}{x-3} + \frac{x}{2} = \frac{12}{x-3}$$

$$\frac{4x(2(x-3))}{x-3} + \frac{x(2(x-3))}{2} = \frac{12(2(x-3))}{x-3}$$

$$8x + x^2 - 3x = 24$$

$$x^2 + 5x - 24 = 0$$

$$(x+8)(x-3) = 0$$

$$x = -8, 3 \text{ where } x=3 \text{ is extraneous}$$

$$26. \frac{3x}{x+1} = \frac{2x-1}{x+1}$$

same denominator so...

$$3x = 2x - 1$$

$$-2x = -2x$$

$$x = -1 \text{ where } x=-1 \text{ is extraneous}$$

$$27. \frac{2}{x(x-1)} = 1 + \frac{2}{x-1}$$

$$\frac{2(x(x-1))}{x(x-1)} = \frac{1(x(x-1))}{1} + \frac{2(x(x-1))}{x-1}$$

$$2 = x^2 - x + 2x$$

$$0 = x^2 + x - 2$$

$$0 = (x+2)(x-1)$$

$$x = -2, 1 \text{ where } x=1 \text{ is extraneous}$$