Section 6.3 – Practice Questions

1. Match the zeros of each function on the left with the solutions on the right

$f(x) = (x-1)^2$
$g(x) = x^2 - 1$
$h(x) = x^2 + 1$

$x = 1$
$(x+1)(x-1)$
no possible

$\emptyset$
1
$-1, 1$

2. Match the zeros of each function on the left with the solutions on the right

$f(x) = (2x-1)^2$
$g(x) = 4x^2 - 1$
$h(x) = 4x^2 + 1$

$\frac{1}{2}$
$\pm \frac{1}{2}$
NO ROOTS

No Roots
$\frac{1}{2}$
$-\frac{1}{2}, \frac{1}{2}$

3. Match the $x - intercepts$ of each function on the left with the solution on the right

$f(x) = 4x^2 - 9$	$\pm 3/2$	*No intercepts*
$g(x) = 4x^2 + 9$	NO intercepts	$-\frac{3}{2}$
$h(x) = 4x^2 - 12x + 9$	$\frac{3}{2}$	$\frac{3}{2}$
$i(x) = 4x^2 + 12x + 9$	$-\frac{3}{2}$	$-\frac{3}{2}, \frac{3}{2}$
$j(x) = 9x^2 - y^2$	$\pm \frac{y}{3}$	$-\frac{y}{3}$
$k(x) = 9x^2 + y^2$	NO INTERCEPTS	$\frac{y}{3}$
$l(x) = 9x^2 - 6xy + y^2$	$\frac{y}{3}$	$\frac{y}{3}, -\frac{y}{3}$
$l(x) = 9x^2 + 6xy + y^2$	$-\frac{y}{3}$	

Solve each quadratic equation by factoring. Check your solutions.

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

$x(x-3)$

$x=0$
$x=3$

Check Solutions:

$0^2-3(0)=0$ ✓

$3^2-3(3)=0$ ✓

5) $2z^2 - 32 = 0$

$2(z^2-16)=0$

$2(z+4)(z-4)=0$

$z=-4$
$z=4$

Check Solutions:

$2(-4)^2-32=0$ ✓

$2(4)^2-32=0$ ✓

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

AC: $x^2-x-12 \rightarrow (x-\frac{4}{2})(x+\frac{3}{2})$

$x=2$
$x=-\frac{3}{2}$

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

Check Solutions:

$2(2)^2-2-6=0$ ✓

$2(-\frac{3}{2})^2-(-\frac{3}{2})-6=0$ ✓

7) $6x^2 - 11x = -3$

$6x^2-11x+3=0 \rightarrow x^2-11x+18$

$x=\frac{3}{2}$ $x=\frac{1}{3}$

$(x-\frac{9}{6})(x-\frac{2}{6})$

$(2x-3)(3x-1) \leftarrow (x-\frac{3}{2})(x-\frac{1}{3})$

Check Solutions:

$6(\frac{3}{2})^2-11(\frac{3}{2})+3=0$ ✓

$6(\frac{1}{3})^2-11(\frac{1}{3})+3=0$ ✓

8) $(2x - 1)(3x + 2) = 24$

$6x^2+4x-3x-2-24=0$

$6x^2+x-26=0$

$x^2+x-156=0 \rightarrow (x+\frac{13}{6})(x-\frac{12}{6})$

$x=-\frac{13}{6}$ $x=2$

$(6x+13)(x-2)$

Check Solutions:

$[2(-\frac{13}{6})-1][3(-\frac{13}{6})+2]-24=0$ ✓

$(2(2)-1)(3(2)+2)-24=0$ ✓

9) $5x^2 = 8x$

$5x^2-8x=0$

$x(5x-8)=0$

$x=0$

$x=8/5$

Check Solutions:

$5(0)^2=8(0)$ ✓

$5(\frac{8}{5})^2=8(\frac{8}{5})$ ✓

10) $12y^2 - 4y = 5$

$12y^2 - 4y - 5 = 0 \rightarrow y^2 - \frac{4}{12}y - \frac{60}{12} = 0$

$y = \frac{5}{6}$ $y = -\frac{1}{2}$ $\left(y - \frac{10}{12}\right)\left(y + \frac{6}{12}\right) = 0$

$(6y - 5)(2y + 1) \leftarrow \left(y - \frac{5}{6}\right)\left(y + \frac{1}{2}\right) = 0$

Check Solutions:

$12\left(\frac{5}{6}\right)^2 - 4\left(\frac{5}{6}\right) - 5 = 0$ ✓

$12\left(-\frac{1}{2}\right)^2 - 4\left(-\frac{1}{2}\right) - 5 = 0$ ✓

11) $2x^2 + 12x = -10$

$2x^2 + 12x + 10 = 0$

$2(x^2 + 6x + 5) = 0 \rightarrow 2(x + 5)(x + 1) = 0$

$x = -5$

$x = -1$

Check Solutions:

$2(-5)^2 + 12(-5) + 10 = 0$ ✓

$2(-1)^2 + 12(-1) + 10 = 0$ ✓

12) $3x^2 + 8x = 9 - 2x$

$3x^2 - 8x + 2x - 9 = 0 \rightarrow 3x^2 - 6x - 9 = 0$

$3(x^2 - 2x - 3) = 0$

$3(x - 3)(x + 1) = 0$

$x = 3$ $x = -1$

Check Solutions:

$3(-1)^2 - 6(-1) - 9 = 0$ ✓

$3(3)^2 - 6(3) - 9 = 0$ ✓

13) $10x^2 - 23x = -12$

$10x^2 - 23x + 12 = 0$

$x^2 - 23x + 120 = 0$

$\left(x - \frac{8}{10}\right)\left(x - \frac{15}{10}\right) = 0$

$\left(x - \frac{4}{5}\right)\left(x - \frac{3}{2}\right) = 0 \rightarrow (5x - 4)(2x - 3) = 0$

$x = \frac{4}{5}$

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

Check Solutions:

$10\left(\frac{4}{5}\right)^2 - 23\left(\frac{4}{5}\right) + 12 = 0$ ✓

$10\left(\frac{3}{2}\right)^2 - 23\left(\frac{3}{2}\right) + 12 = 0$ ✓

14) $\left[\frac{3}{x-1} + x = 5\right](x - 1)$

$3 + x(x - 1) = 5(x - 1)$

$3 + x^2 - x = 5x - 5$

$x^2 - 6x + 8 \rightarrow (x - 4)(x - 2)$

$x = 4$ $x = 2$

Check Solutions:

$\frac{3}{4-1} + 4 - 5 = 0$ ✓

$\frac{3}{2-1} + 4 - 5 = 0$ ✓

15) $\left[\frac{1}{x} - x = \frac{8}{3}\right] 3x$

$3 - 3x^2 = 8x$

$3x^2 + 8x - 3 = 0$

$x^2 + 8x - 9 = 0$

$(x + 9)(x - 1) = 0 \rightarrow \left(x + \frac{9}{3}\right)\left(x - \frac{1}{3}\right)$

$(x + 3)(3x - 1)$

$x = -3$

$x = \frac{1}{3}$

Check Solutions:

$\frac{1}{-3} - (-3) = \frac{8}{3}$ ✓

$\frac{1}{\frac{1}{3}} - \frac{1}{3} = \frac{8}{3}$ ✓