Int 3 C8.2.1 WS Name _____ Per ____ Group ____

1. Write a polynomial function in standard form with the given roots. x = -3, 4, 2

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

$y = (x^2 - x - 12)(x-2)$

	x	$+3$
x	x^2	$3x$
-4	$-4x$	-12

	x^2	$-x$	-12
x	x^3	$-x^2$	$-12x$
-2	$-2x^2$	$+2x$	$+24$

$\boxed{y = x^3 - 3x^2 - 10x + 24}$

2. Write a quadratic function in standard form given the roots $x = \frac{3}{4}$ and $x = -5$.

$y = 4(x - \frac{3}{4})(x+5)$

$y = (4x-3)(x+5)$

	$4x$	-3
x	$4x^2$	$-3x$
$+5$	$20x$	-15

$\boxed{y = 4x^2 + 17x - 15}$

3. Write a quadratic function in standard form given the roots $x = 3i$ and $x = -3i$.

$y = (x-3i)(x+3i)$

	x	$-3i$
x	x^2	$\cancel{-3ix}$
$+3i$	$\cancel{+3ix}$	$-9i^2$ → $-9(-1)$ ← $+9$

$\boxed{y = x^2 + 9}$

4. Write a quadratic function in standard form given the roots $x = 5 + 2i$ and $x = 5 - 2i$.

$x = 5 + 2i$

$y = (x - 5 - 2i)(x - 5 + 2i)$

$x = 5 - 2i$

$x - 5 + 2i = 0$

	x	-5	$-2i$
x	x^2	$-5i$	$\cancel{-2xi}$
-5	$-5x$	$+25$	$\cancel{+10i}$
$+2i$	$\cancel{+2ix}$	$\cancel{-10i}$	$-4i^2$ → $-4(-1)$ → 4

$\boxed{y = x^2 - 10x + 29}$

5. Write a quadratic function in standard form given the roots $x=-3+\sqrt{2}$ and $x=-3-\sqrt{2}$.

$y=(x+3-\sqrt{2})(x+3+\sqrt{2})$

	x	$+3$	$-\sqrt{2}$
x	x^2	$3x$	$-\sqrt{2}x$
$+3$	$3x$	9	$-3\sqrt{2}$
$+\sqrt{2}$	$+\sqrt{2}x$	$+3\sqrt{2}$	-2

$\boxed{y=x^2+6x+7}$

6. Write a quadratic function in standard form given the roots $x=5$. $x=5$

$y=(x-5)(x-5)$

$\boxed{y=x^2-10x+25}$

7. Write a quadratic function in standard form given the roots $x=\sqrt{2}$ and $x=-\sqrt{2}$.

$y=(x-\sqrt{2})(x+\sqrt{2})$

$\boxed{y=x^2-2}$

8. Write a polynomial function in standard form given the roots $x=2-3i$ and $x=-1$.

$x=2+3i$

$y=(x-2+3i)(x-2-3i)(x+1)$

$y=(x^2-4x+13)(x+1)$

$\boxed{y=x^3-3x^2+9x+13}$