

Post-test 2 review worksheet. MATH 30.

- Write down the statement of the Factor Theorem.
- Write down a polynomial with the following properties:
 - It has degree 3 and zeros at -1 , 5 and 9 .
 - It has degree 4 and zeros at 2 , 3 and -4 .
 - It has degree 5 and zeros at -3 , -4 and 0 .
 - It has degree 4, zeros at 0 , 1 and -1 , and y -intercept 4 .
- Write down the statement of the Remainder Theorem.
- Find the remainder of the following divisions:

a) $\frac{x^{100} + 2x^{51} - 6x^{23} + 5}{x - 1}$ b) $\frac{x^{13} - 4x^5 - 6x^4 + 5}{x + 1}$ c) $\frac{x^{15} - 5x^8 + 7x^5 + 5x}{x + 1}$

- Write down the exact value of:

$\sin 0 =$	$\sin \frac{\pi}{6} =$	$\sin \frac{\pi}{4} =$	$\sin \frac{\pi}{3} =$	$\sin \frac{\pi}{2} =$	$\sin \frac{2\pi}{3} =$
$\sin \frac{3\pi}{4} =$	$\sin \frac{5\pi}{6} =$	$\sin \pi =$	$\sin \frac{7\pi}{6} =$	$\sin \frac{5\pi}{4} =$	$\sin \frac{4\pi}{3} =$
$\sin \frac{3\pi}{2} =$	$\sin \frac{5\pi}{3} =$	$\sin \frac{7\pi}{4} =$	$\sin \frac{11\pi}{6} =$		
$\cos 0 =$	$\cos \frac{\pi}{6} =$	$\cos \frac{\pi}{4} =$	$\cos \frac{\pi}{3} =$	$\cos \frac{\pi}{2} =$	$\cos \frac{2\pi}{3} =$
$\cos \frac{3\pi}{4} =$	$\cos \frac{5\pi}{6} =$	$\cos \pi =$	$\cos \frac{7\pi}{6} =$	$\cos \frac{5\pi}{4} =$	$\cos \frac{4\pi}{3} =$
$\cos \frac{3\pi}{2} =$	$\cos \frac{5\pi}{3} =$	$\cos \frac{7\pi}{4} =$	$\cos \frac{11\pi}{6} =$		

- Divide the following polynomials using long division. Write the answer as $D = d \cdot q + r$.

a) $\frac{x^3 + 2x^2 + 2x - 2}{x^2 - 2x - 1}$ b) $\frac{3x^3 - 2x^2 - 6x + 7}{x^2 - 7x + 5}$
c) $\frac{x^5 + 2x^2 - 2}{x^3 - 2x - 1}$ d) $\frac{4x^3 + x^2 + 7x - 2}{2x + 3}$

- Find the vertex, x -intercepts and y -intercepts of the graph of:

a) $f(x) = -2(x + 2)^2 + 8$ b) $f(x) = 3(x - 2)^2 - 9$
c) $f(x) = -5(x + 3)^2 + 25$ d) $f(x) = 2(x - 4)^2 - 5$

- Find all the solutions of the following equations:

a) $x^3 - 5x^2 + 6x - 2 = 0$ b) $x^3 + 4x^2 - 8x - 8 = 0$
c) $x^3 - 9x^2 + 5x + 15 = 0$ d) $x^3 - 6x^2 - 6x + 20 = 0$

- Factor completely the following polynomials

a) $f(x) = x^5 - 2x^4 - 12x^3 + 14x^2 + 11x - 12$ b) $f(x) = x^5 - 2x^4 - 6x^3 + 8x^2 + 5x - 6$
c) $f(x) = x^5 + 3x^4 - 14x^3 - 18x^2 + 13x + 15$ d) $f(x) = x^6 + 6x^5 + 6x^4 - 12x^3 - 15x^2 + 6x + 8$
e) $f(x) = x^5 + x^4 - 17x^3 + 19x^2 + 16x - 20$