

## MHF4U: Practice Test – Polynomial Functions

Name: \_\_\_\_\_

Mark:  $\frac{\quad}{18}$   $\frac{\quad}{16}$

KU APP

1. Determine if  $x = -3$  is contained in the solution set of the inequality  $\frac{-x+5}{2} \leq -2(3x-5)$ ? [KU/2]

**YES**

2. Determine the y-intercept (algebraically) of the cubic function that has x-intercepts at 2, 3, and -5 and passes through the point (-3,-180). [KU/4] **(0,-90)**
3. Solve the following polynomial equations fully. [KU/12]

A)  $-2x^4 + 26x^2 - 24x = 0$  [4]  **$x = -4, 0, 1, 3$**

B)  $\frac{x(x^2-4)}{2} = \frac{5}{6}x^2 - \frac{10}{3}$  [4]  **$x = -2, 5/3, 2$**

C)  $5x^2(x+4) = -9x - 2(x^2+2)$  [4]  **$x = \frac{-1 \pm 2i}{5}$  and  $x = -4$**

4. Solve the following inequalities. Express answers using interval notation. [APP/10]

A)  $-10x + 3 \geq 2x - 3$  [2]  **$x \in \left(-\infty, \frac{1}{2}\right]$**

B)  $-6x^2(x-1)^2(x-3) > 0$  [4]  **$x \in (-\infty, 0)$   
 $x \in (0, 1)$   
 $x \in (1, 3)$**

C)  $-3x < \frac{x+4}{2} \geq 2(x-4)$  [4]  **$x \in \left(\frac{-4}{7}, \frac{20}{3}\right]$**

5. A) Determine the value of "k" such that  $(x+2)$  is a factor of the polynomial function

$y = 4x^4 - 3kx^3 + (k-4)x^2 - 4x$ . [APP/2]  **$k = -2$**

- B) Sketch the polynomial function  $y = 4x^4 - 3kx^3 + (k-4)x^2 - 4x$  from above on the grid below.  
(Include an appropriate scale for full marks) [APP/4]  **$f(x) = 2x(x-1)(2x+1)(x+2)$**

6. Determine when  $f(x) > g(x)$  if  $g(x) = 2x - 6$  and  $f(x) = 7x^3 - 16x^2 - 15x$ . [APP/4]

**$x \in \left(-1, \frac{2}{7}\right)$  and  $x \in (3, \infty)$**