**Chapter 3 TEST**

**Graphing Calculator allowed**

**Multiple Choice [6]**

**\_\_\_\_ 1.** Which graph represents an odd-degree polynomial function with two *x*-intercepts?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** |  | **C** |  |
| **B** |  | **D** |  |

**\_\_\_\_ 2.** How many different *x*-intercepts are possible at most for the polynomial function ?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | 4 | **C** | 3 |
| **B** | 5 | **D** | 1 |

**\_\_\_\_ 3.** What is the remainder when  is divided by **?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | 1070 | **C** | 962 |
| **B** | –1070 | **D** | –962 |

**\_\_\_\_ 4.** For a polynomial *P*(*x*), if ** = 0, then which of the following must be a factor of *P*(*x*)?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** |  | **C** |  |
| **B** |  | **D** |  |

**\_\_\_\_ 5.** A factor of  is

|  |  |  |  |
| --- | --- | --- | --- |
| **A** |   | **C** |   |
| **B** | *x* – 5 | **D** | *x* – 8 |

**\_\_\_\_ 6.** Determine the value of *k* so that ** is a factor of .

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | *k* = –1 | **C** | *k* = 14 |
| **B** | *k* = –14 | **D** | *k* = 1 |

**Short Answer**

**\_\_\_\_ 7. G**raph a possible degree 5 polynomial function with zeros –6 (multiplicity of 1) and –1 (multiplicity of 2): [2]

 

 **8.** Show that *x* + 1 is a factor of *P*(*x*) = *x*3 + 2*x*2 + 3*x* + 2. [1]

 **9.** Factor fully.

**a)** 4*x*3 – 11*x*2 – 3*x*  [2]

 **b)** *x*4 – 81 [2]

 **10.** Solve by factoring. [3]

8*x*3 – 6*x*2 – 23*x* + 6 = 0

 **11.** Consider the polynomial$P\left(x\right)=x^{3}+3x^{2}-x-3$. [6]
a) What is the general shape of its graph (without any calculation and without looking at your calculator). You don’t need to be precise!

b) If the polynomial could be factored by $(x-a)$, what are the possible values of *a* that you could consider?

c) Show that $(x+1)$ is a factor and factor the polynomial fully.

c) Determine the *x*-intercepts and the *y*-intercept of this graph.

d) Determine the intervals where the polynomial is positive.

 **12.** Divide $2x^{3}+x^{2}-2x+1$ by $(x+1)$ and express you answer appropriately. [2]

**Problems**

 **13.** The height, *h*, in metres, of a weather balloon above the ground after *t* seconds can be modelled by the function *h*(*t*) = –2*t*3 + 3*t*2 + 149*t* + 410, for . When is the balloon exactly 980 m above the ground? Solve algebraically. [2]

 **14.** Determine an equation in factored form for the polynomial functions represented by the following graphs: [4]

 