# 3.7-3.10 Test Review - Answers worked out

(1) (A)

| 2 | 2 | 2 | -16 | -24 |
|---|---|---|---|---|
| | ↓ | 4 | 12 | -8 |
| | 2 | 6 | -4 | (-32) |

$x-2$ $r=-32$

(2) (B)

| -2 | 2 | 2 | -16 | -24 |
|---|---|---|---|---|
| | ↓ | -4 | 4 | 24 |
| | 2 | -2 | -12 | (0) |

$x+2$ $r=0$

(3) (C)

| 5 | 2 | 2 | -16 | -24 |
|---|---|---|---|---|
| | ↓ | 10 | 60 | 220 |
| | 2 | 12 | -44 | (196) |

$x-5$ $r=196$

(4) (D)

| -5 | 2 | 2 | -16 | -24 |
|---|---|---|---|---|
| | ↓ | -10 | 40 | -120 |
| | 2 | -8 | 24 | (-144) |

$x+5$ $r=-144$

(2) $x+2$ was a factor because the remainder $=0$

(3) Put all Equations in the graphing calculator and find which graph crosses the x-axis at $x=-3$ & $x=2$

(4) $\underline{1}\,x^3\cdot 2^0 + \underline{3}\,x^2\cdot 2^1 + \underline{3}\,x^1\cdot 2^2 + \underline{1}\,x^0\cdot 2^3$

$1\cdot x^3\cdot 1 + 3\cdot x^2\cdot -2 + 3\cdot x\cdot 4 + 1\cdot 1\cdot -8$

$x^3 + -6x^2 + 12x - 8$

(5) $\underline{1}\,3^4a^4\cdot 2^0 + \underline{4}\,3^3a^3\cdot 2^1 + \underline{6}\,3^2a^2\cdot 2^2 + \underline{4}\,3^1a^1\cdot 2^3 + \underline{1}\,3^0a^0\cdot 2^4$

$1\cdot 81a^4\cdot 1 + 4\cdot 27a^3\cdot 2 + 6\cdot 9\cdot a^2\cdot 4 + 4\cdot 3a\cdot 8 + 1\cdot 1\cdot 1\cdot 16$

$81a^4 + 216a^3 + 216a^2 + 96a + 16$

⑥

$$x^2 + 5x + 10 + \frac{24}{x-3}$$

$x - 3 \;\big|\; x^3 + 2x^2 - 5x - 6$

$x^2(x-3) \Longrightarrow -x^3 + 3x^2$

$5x^2 - 5x$

$5x(x-3) \Longrightarrow -5x^2 + 15x$

$10x - 6$

$10(x-3) \Longrightarrow -10x + 30$

$24$

$x \cdot x^2 = x^3$

$x \cdot 5x = 5x^2$

$x \cdot 10 = 10x$

(7)
$$x+2 \;\overline{)\; x^3+3x^2-x+5}$$

$x^2+x-3+\frac{11}{x+2}$

$-x^3+2x^2$

$x^2-x$

$-x^2+2x$

$-3x+5$

$+3x+6$

$11$

(8)
$$5 \;\big|\; 1 \quad 2 \quad -5 \quad -6$$
$$\qquad\quad 5 \quad 35 \quad 150$$
$$1 \quad 7 \quad 30 \quad 144$$

$x^2+7x+30+\frac{144}{x-5}$

(9)
$$-3 \;\big|\; 1 \quad 4 \quad -5 \quad 1$$
$$\qquad\quad -3 \quad -3 \quad 24$$
$$1 \quad 1 \quad -8 \quad 25$$

$x^2+x-8+\frac{25}{x+3}$

(10)
$$-1 \;\big|\; 1 \quad 3 \quad 3 \quad 1$$
$$\qquad\quad -1 \quad -2 \quad -1$$
$$1 \quad 2 \quad 1 \quad 0$$

$x^2+2x+1$

$1 \quad 1$

$1 \quad 1$

$2$

$(x+1)$ $(x+1)^2$

$f(x) = (x+1)^3$

(11) $\sqrt{x^4} = \sqrt{16}$ $\sqrt{x^2} = \sqrt{4}$ $\sqrt{x^2} = \sqrt{-4}$

$x = 2$ $x = 2i$

$x = -2$ $x = -2i$

$f(x) = (x-2)(x+2)(x-2i)(x+2i)$

(12) A: 4 Zeros 2 real + 2 complex Zeros

B: $\sqrt{x^4} = \sqrt{81}$ $\sqrt{x^2} = \sqrt{9}$ $\sqrt{x^2} = \sqrt{-9}$

$x = 3$ $x = 3i$

$x = -3$ $x = -3i$

used the square root method Twice to find the Zeros.

C: $x^4 + 81$ will have 4 Complex Zeros because the graph will never cross the x-axis