

①^a $P(-4) = (-4)^3 - 12(-4) + 16 = -64 + 48 + 16 = -16 + 16 = 0 \checkmark$

② $P(-4) = (-4)^3 - 5(-4)^2 + 8(-4) - 4 = -64 - 80 - 32 - 4 \neq 0$

③ $P(-4) = (-4)^3 - 7(-4)^2 + 14(-4) - 8 = -64 - 112 - 56 - 8 \neq 0$

A, D & E

④
$$\begin{array}{r|rrrr} -4 & 1 & 3 & -10 & -24 \\ & & -4 & 4 & 24 \\ \hline & 1 & -1 & -6 & 0 \end{array} \checkmark$$

⑤
$$\begin{array}{r|rrrr} -4 & 1 & 12 & 48 & 64 \\ & & -4 & -32 & -64 \\ \hline & 1 & 8 & 16 & 0 \end{array} \checkmark$$

⑥
$$\begin{array}{r|rrrrr} 4 & 1 & -2 & -13 & 38 & -24 \\ & & 4 & -8 & -84 & -184 \\ \hline & 1 & -2 & -21 & -46 & -208 \end{array}$$

⑦
$$\begin{array}{r|rrrrr} 1 & 1 & -2 & -13 & 38 & -24 \\ & & 1 & -1 & -14 & 24 \\ \hline & 1 & -1 & -14 & 24 & 0 \end{array} \checkmark$$

⑧
$$\begin{array}{r|rrrrr} 4 & 1 & -2 & -13 & 38 & -24 \\ & & 4 & -8 & -84 & -184 \\ \hline & 1 & -2 & -21 & -46 & -208 \end{array}$$

⑨
$$\begin{array}{r|rrrrr} 1 & 1 & -2 & -13 & 38 & -24 \\ & & 1 & -1 & -14 & 24 \\ \hline & 1 & -1 & -14 & 24 & 0 \end{array} \checkmark$$
 B

⑩
$$\begin{array}{r|rrrrr} -1 & 8 & 5 & 4 & -1 & 7 \\ & & -8 & 3 & -7 & +8 \\ \hline & 8 & -3 & 7 & -8 & 1-1 \end{array}$$

$8x^3 - 3x^2 + 7x - 8 + \frac{15}{x+1}$

B

⑪
$$\begin{array}{r|rrrrr} 1 & 2 & 0 & -3 & -4 & 7 \\ & & 2 & 2 & -1 & -5 \\ \hline & 2 & 2 & -1 & -5 & 12 \end{array}$$

B

⑫ **D**

⑬ **B**

⑭ Positive lead coefficient & Odd degree

C & F

⑮ **B**

⑯ **A**

⑰ $\frac{792(1-0.04)^x}{792} = \frac{674}{792}$

$(.96)^x = .85$
 $\log_{.96}(.85) = x$

D

⑱ **A, C and E**

⑲ a) increasing & y-int=1
b) decreasing & y-int=1

c) decreasing & y-int=1
d) increasing & y-int=1
 $f(x) = 2^x$

B & C

⑳ Asymptote at $x=3$ **C & E**

㉑ **C**

㉒ $(h,k) = (-4,2)$ **D**

㉓ $x = y^3 - 4$
 $+4$ $+4$
 $\sqrt[3]{y^3} = \sqrt[3]{x+4}$
 $y = \sqrt[3]{x+4}$ **A**

㉔ **A, B and C**

㉕ $8^{3x+4x} = 8^{7x}$

㉖ $8^{3x-4x} = 8^{-x} = \left(\frac{1}{8}\right)^x$

18

	$2x^2$	$3x$	-1
x	$2x^3$	$3x^2$	$-x$
-1	$-2x^2$	$-3x$	1

$2x^3 + x^2 - 4x + 1$

D

19

$(9x^3 - 4x^2 + 10x - 55) - (4x^3 + 3x^2 - 5x + 20)$

$9x^3 - 4x^2 + 10x - 55 - 4x^3 - 3x^2 + 5x - 20$

$5x^3 - 7x^2 + 15x - 75$

D

20

$x^3 + 4x^2 - x - 3x^3 + x - 1 - 2x^3 + 4x^2 - 1$

A

21 **A, B and D** (c) $f(x) = |x| - 3$ is all real #s (e) $f(x) = 3^x$ is all real #s

22 **A**

23

$\sqrt{2x+4} + 5 = x+3$

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

$2x+4 = x^2 - 4x + 4$

$-2x - 4 = -2x - 4$

$0 = x^2 - 6x$

$0 = x(x-6)$

$x=0$ $x-6=0$
 $+6$ $+6$

Check $x=0$ $x=6$

$\sqrt{2(0)+4} + 5 = 0+3$

$\sqrt{4} + 5 = 3$

$2+5 = 3$

0 is extraneous

Check $x=6$

$\sqrt{2(6)+4} + 5 = 6+3$

$\sqrt{12+4} + 5 = 9$

$\sqrt{16} + 5 = 9$

$4+5 = 9$ ✓

C

24

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$(1, 66)$ & $(3, 240)$
 x_1, y_1 x_2, y_2

$m = \frac{240 - 66}{3 - 1} = \frac{174}{2}$

$\frac{87}{14}$

B