

1 a)  $(-2, -3)$     b)  $(-2, 3)$     c)  $(-3, 2)$

2) a)  $x^2 - 25 \neq 0$

$$(x-5)(x+5) = 0$$
$$x \neq \pm 5$$

$$\boxed{(-\infty, -5) \cup (-5, 5) \cup (5, \infty)}$$

b)  $x+3 \geq 0$   
 $x \geq -3$

$$\boxed{[-3, \infty)}$$

c)  $x+1 > 0$   
 $x > -1$

$$\boxed{(-1, \infty)}$$

d)  $x+3 \geq 0$   
 $x \geq -3$

$$x^3 + x \neq 0$$
$$x(x^2+1) = 0$$
$$x \neq 0 \quad x^2+1 \neq 0$$

$$\boxed{[-3, 0) \cup (0, \infty)}$$

3) a)  $f(-x) = 6(-x)^4 - (-x)^5$   
 $= 6x^4 + x^5$

$$-f(x) = -(6x^4 - x^5)$$
$$= -6x^4 + x^5$$

neither

b)  $w(-x) = \sqrt{(-x)^2 - 1} = \sqrt{x^2 - 1}$     even

c)  $h(-x) = \frac{3}{(-x^3) + (-x)} = \frac{3}{-x^3 - x}$

$$-h(x) = -\left(\frac{3}{x^3 + x}\right) = \frac{-3}{x^3 + x} \quad \text{or} \quad \frac{3}{-x^3 - x} \quad \text{odd}$$

$$4) a) g(f(x)) = g(x+1) = \sqrt{x+1+2} = \boxed{\sqrt{x+3}}$$

$$b) f(g(4)) = f(4) = \boxed{5}$$

$$c) \frac{f}{h}(x) = \frac{x+1}{x^2-1} - \frac{x+1}{(x+1)(x-1)} = \boxed{\frac{1}{x-1} \quad x \neq 1, -1}$$

$$d) f-h(x) = x+1 - (x^2-1) = \boxed{-x^2+x+2}$$

8 a) y axis    b) origin    c)  $y=x$

$$9) g(x) = 2(x-3)^3 + 1$$

$$10) c(4) + 2 + 1 = -2c - 6$$

$$4c + 3 = -2c - 6$$

$$6c = -9$$

$$c = \frac{-9}{6} = \boxed{\frac{-3}{2}}$$

$$11) f(g(x)) = \frac{2x+3-3}{2} = \frac{2x}{2} = x$$

$$g(f(x)) = 2\left(\frac{x-3}{2}\right) + 3 = x-3+3 = x$$

yes!!

12

- a)  $(-\infty, -1.57) \cup (0, .636)$   
 b)  $(.636, 0) \cup (.636, \infty)$   
 c)  $(-1.57, -.523)$   $(.636, -1.87)$   
 d)  $(0, -2)$   
 e) None

~~13) a)  $x = \frac{2y+3}{5y-2}$~~

~~$f^{-1}(x) = \frac{2x+3}{5x-2}$~~

~~$$x(5y-2) = 2y+3$$

$$5xy - 2x = 2y+3$$

$$5xy - 2y = 2x+3$$

$$y(5x-2) = 2x+3$$

$$\frac{y(5x-2)}{5x-2} = \frac{2x+3}{5x-2}$$~~

SEE  
END

~~$$b) x = \sqrt[3]{y+2} - 1$$

$$x+1 = \sqrt[3]{y+2}$$

$$(x+1)^3 = y+2$$

$$(x+1)^3 - 2 = y$$~~

~~$f^{-1}(x) = (x+1)^3 - 2$~~

for f(x)

~~14) a)  $\lim_{x \rightarrow -\infty} f(x) = \infty$   $\lim_{x \rightarrow \infty} f(x) = -\infty$~~

~~b)  $\pm 1, \frac{1}{2}, 2, 3, \frac{3}{2}$~~

for g(x)

~~a)  $\lim_{x \rightarrow -\infty} g(x) = -\infty$   $\lim_{x \rightarrow \infty} g(x) = -\infty$~~

~~15) a) 
$$\begin{array}{r} 2 \quad 2 \quad 4 \quad -1 \quad 4 \\ \quad \quad 4 \quad 16 \quad 30 \\ \hline 2 \quad 8 \quad 15 \quad 34 \\ \hline 2x^2 + 8x + 15 + \frac{34}{x-2} \end{array}$$~~

$$\begin{array}{r}
 3x + 4 \\
 16) \ a) \ 2x^2 + 1 \overline{) 6x^3 + 8x^2 + x + 8} \\
 \underline{-(6x^2 \quad + 3x)} \phantom{+ 8} \\
 8x^2 - 2x + 8 \\
 \underline{-(8x^2 \quad + 4)} \\
 -2x + 4
 \end{array}$$

$$\begin{array}{l}
 17) \ a) \ (x-4)(x-3i)(x+3i) \\
 \phantom{17) \ a) \ } \ (x-4)(x^2+9)
 \end{array}$$

$$\boxed{f(x) = x^3 - 4x^2 + 9x - 36}$$

$$\begin{array}{r}
 18) \ \underline{2} \mid \quad 1 \quad 3 \quad -4 \quad -12 \\
 \phantom{18) \ \underline{2} \mid \quad } \quad \quad 2 \quad 10 \quad 12 \\
 \hline
 \phantom{18) \ \underline{2} \mid \quad } \quad 1 \quad 5 \quad 6 \quad 0
 \end{array}$$

yes because the remainder is 0

$$\begin{array}{l}
 19) \ a = kt^2 \qquad 12 = k(2)^2 \\
 \phantom{19) \ } \qquad \qquad \qquad 3 = k
 \end{array}$$

$$a = 3t^2$$

$$a = 3(3)^2$$

$$\boxed{a = 27}$$

$$20 \quad V = \frac{K}{p}$$

$$300 = \frac{K}{48}$$

$$14400 = K$$

$$V = \frac{14400}{p}$$

$$V = \frac{14400}{25}$$

$$576 \text{ Kg/cm}^3$$

21 Get  $-3 \pm 4$  from calculator

$$\begin{array}{r|rrrrr} -3 & 1 & -1 & -8 & -4 & -48 \\ & & -3 & 12 & -12 & 48 \\ \hline 4 & 1 & -4 & 4 & -16 & 0 \\ & & 4 & 0 & 16 & \\ \hline & 1 & 0 & 4 & 0 & \end{array}$$

$$\begin{aligned} x^2 + 4 &= 0 \\ \sqrt{x^2} &= \pm\sqrt{-4} \end{aligned}$$

$$x = \pm 2i$$

$$\boxed{-3, 4, 2i, -2i}$$

$$\begin{array}{r|rrrrr} 2+3i & 1 & -4 & 14 & -4 & 13 \\ & & 2+3i & -13 & 2+3i & -13 \\ \hline 2-3i & 1 & -2+3i & 1 & -2+3i & 0 \\ & & 2-3i & 0 & 2-3i & \\ \hline & 1 & 0 & 1 & 0 & \end{array}$$

$$\begin{aligned} x^2 + 1 &= 0 \\ \sqrt{x^2} &= \pm\sqrt{-1} \\ x &= \pm i \end{aligned}$$

$$\boxed{2+3i, 2-3i, i, -i}$$

$$23) \quad 6x^2 - 23x - 4$$

$$(6x+1)(x-4)$$

$$-24$$

$$6x$$

$$+1$$

	$x$	$-4$
$6x$	$6x^2$	$-24x$
$+1$	$+x$	$-4$

$$13) A) x = \frac{4y-5}{3y+2}$$

$$3y+2(x) = 4y-5$$

$$3xy+2x = 4y-5$$

$$3xy-4y = -2x-5$$

$$y(3x-4) = -2x-5$$

$$y = \frac{-2x-5}{3x-4}$$