

Algebra II Pre-Ap Cumulative Review 2016

(P.1)

1. Domain:  $[2, 13]$  or  $2 \leq x \leq 13$  or  $\{x \mid 2 \leq x \leq 13\}$   
 Range:  $[1, 8]$  or  $1 \leq y \leq 8$  or  $\{y \mid 1 \leq y \leq 8\}$

2. shift up 7 units

3. 2 to the left ; 4 down ; Vertical Stretch

4.  $y = 3x - 4$

$x = 3y - 4$

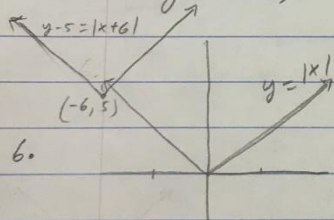
$\frac{x+4}{3} = y = f^{-1}(x)$

5. Domain:  $(-\infty, \infty)$  ;  $-\infty < x < \infty$  ;  $\{x \mid -\infty < x < \infty\}$

Range:  $[2, \infty)$  ;  $2 \leq y < \infty$  ;  $\{y \mid 2 \leq y < \infty\}$

as  $x \rightarrow \infty$ ,  $y \rightarrow \infty$

as  $x \rightarrow -\infty$ ,  $y \rightarrow \infty$



$y = |x + 6| + 5$

7.  $4|x + 7| = 56$

$|x + 7| = 14$

$x + 7 = 14$  or  $x + 7 = -14$

$x = 7$  or  $x = -21$

$$8. -5|x+1|+2=12$$

$$|x+1| = -2$$

No Solution

$$9. 2|x+15| > 8$$

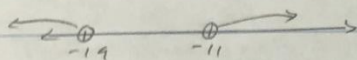
$$|x+15| > 4$$

$$x+15 > 4$$

$$\text{or } x+15 < -4$$

$$x > -11$$

$$\text{or } x < -19$$



$$10. 5x^2 - 4 = -8$$

$$5x^2 = -4$$

$$x^2 = \frac{-4}{5} = \frac{\pm 2i}{\sqrt{5}} = \boxed{\frac{\pm 2i\sqrt{5}}{5}}$$

$$11. x^2 + 64 = 0$$

$$x^2 = -64$$

$$\boxed{x = \pm 8i}$$

$$12. (5+9i) - (3-3i)$$

$$\boxed{2+12i}$$

$$13. (i\sqrt{5} + 3)(i\sqrt{5} - 3)$$

$$-5 - 9 = \boxed{-14}$$

$$14. x^2 + 2x = -2$$

$$x^2 + 2x + 2 = 0$$

$$\frac{-2 \pm \sqrt{4-8}}{2}$$

$$= \frac{-2 \pm 2i}{2} = \boxed{-1 \pm i}$$

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15.  $x^2 + 8x + 10 = 0$

$$\frac{-8 \pm \sqrt{64 - 40}}{2}$$

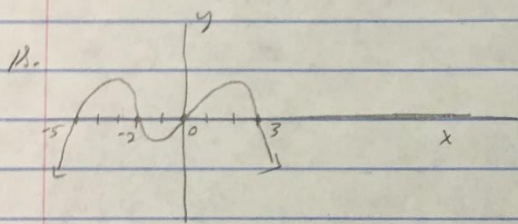
$$\frac{-8 \pm 2\sqrt{6}}{2} = \boxed{-4 \pm \sqrt{6}}$$

16.  $x^2 + 3x - 10 = 0$

$$(x+5)(x-2) = 0$$

$$\boxed{x = -5, 2}$$

17.  $x^4$  or Quartic function ; 5 units to the right



19.  $x = -4$  double root, 0, 5

$$20. x(x+4)^2(x-5) = y$$

21.  $(x^3 - 4x + 7) - (3x^3 - 2x^2 + 6x - 4)$

$$\boxed{-2x^3 + 2x^2 - 10x + 11}$$

22.  $(2x+3)(2x^2-5x+1)$

$$4x^3 - 10x^2 + 2x$$

$$6x^2 - 15x + 3$$

$$\boxed{4x^3 - 4x^2 - 13x + 3}$$

$$\begin{array}{r}
 1 \\
 5 \\
 10 \\
 10 \\
 5 \\
 1
 \end{array}
 \begin{array}{r}
 x^5 \\
 5x^4(3y) \\
 10x^3(3y)^2 \\
 10x^2(3y)^3 \\
 5x(3y)^4 \\
 (3y)^5
 \end{array}$$

$$\begin{array}{r}
 1331 \\
 14641 \\
 151051
 \end{array}$$

$$23. (x+3y)^5 = x^5 + 5x^4(3y) + 10x^3(3y)^2 + 10x^2(3y)^3 + 5x(3y)^4 + (3y)^5$$

$$= x^5 + 15x^4y + 90x^3y^2 + 270x^2y^3 + 405xy^4 + 243y^5$$

$$24. 5x^4 - 80$$

$$5(x^4 - 16) = 5(x+2)(x-2)(x+2i)(x-2i)$$

$$25. (x^2 - 4x + 16)$$

$$26. \begin{array}{r}
 3 \overline{) 4} \quad -12 \quad 2 \quad -5 \\
 \underline{4} \quad \quad 12 \quad 0 \quad 6 \\
 \quad \quad \quad 0 \quad 2 \quad 1
 \end{array}$$

since a remainder 3 is not a zero  $\therefore x-3$  is not a factor

$$27. 10x^4 - 5x^3 - 30x^2$$

$$5x^2(2x^2 - x - 6) = 5x^2(2x+3)(x-2)$$

$$28. x^3 + 3x^2 - x - 3$$

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

$$29. \begin{array}{r}
 \phantom{x-3} \overline{) 4x^2 - 9x + 7} \\
 \underline{4x^2 - 12x} \phantom{+ 7} \\
 \phantom{4x^2} 3x + 7 \\
 \underline{-(3x - 9)} \\
 \phantom{4x^2} \phantom{3x} 16
 \end{array}$$

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(P.3)

30. a)  $\frac{2x^2 - 5x - 12}{2x + 3}$

b)  $(2x^2 - 5x - 12)(2x + 3)$

$$\begin{array}{r} 4x^3 - 10x^2 - 24x \\ 6x^2 - 15x - 36 \end{array}$$

$$\boxed{4x^3 - 4x^2 - 39x - 36}$$

c)  $g(f(x)) = 2(2x^2 - 5x - 12) + 3$   
 $= 4x^2 - 10x - 24 + 3 = \boxed{4x^2 - 10x - 21}$

31.  $7x^3 - 5x^2 + 12x - 3$

$$\boxed{\frac{p}{q} : \pm 1, \pm 3, \pm \frac{1}{7}, \pm \frac{3}{7}}$$

32. a) 6<sup>th</sup> degree

b)  $(x - \sqrt{3})(x + \sqrt{3})(x - 3i)(x + 3i)(x - 5i)(x + 5i)$   
 $(x^2 - 3)(x^2 + 9)(x^2 + 25)$

$$\begin{array}{r} (x^4 + 6x^2 - 27)(x^2 + 25) \\ x^6 + 25x^4 \\ 6x^4 + 150x^2 \\ - 27x^2 - 675 \end{array}$$

$$\boxed{x^6 + 31x^4 + 123x^2 - 675}$$

33.  $x^3 - 3x^2 + 4x - 12$

$$x^2(x - 3) + 4(x - 3)$$

$$(x^2 + 4)(x - 3)$$

$$\boxed{x = 3, \pm 2i}$$

$$34. x^4 + 5x^3 + 6x^2 - 4x - 8$$

$$\begin{array}{r} -2 \overline{) 1 \ 5 \ 6 \ -4 \ -8} \\ \underline{-2 \ -6 \ 0 \ 8} \\ 1 \ 3 \ 0 \ -4 \ 0 \end{array}$$

$x = -2$  (triple root); 1

$$\begin{array}{r} 1 \overline{) 1 \ 3 \ 0 \ -4} \\ \underline{1 \ 4 \ 4 \ 0} \end{array}$$

$$x^2 + 4x + 4$$

$$(x+2)(x+2)$$

$$35. \frac{1}{x-8} + 9 = \frac{9x-71}{x-8}$$

$$\text{V.A: } x=8$$

$$\text{Domain } (-\infty, 8) \cup (8, \infty)$$

$$\text{H.A: } y=9$$

$$\text{Range } (-\infty, 9) \cup (9, \infty)$$

SA: none

$$36. \frac{x^2 + 4x + 4}{x^2 - 4} = \frac{(x+2)(x+2)}{(x+2)(x-2)}$$

$$\text{V.A: } x=2$$

$$\text{H.A: } y=1$$

SA: none

$$37. \frac{x^2 + 7x + 10}{x+3} = \frac{(x+5)(x+2)}{(x+3)}$$

no holes

