"Remember When" you knew some Algebra II

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Honors Trigonometry

Part I For each item in the following list, write a **brief** definition and give an example of its use.

A) member B) element C) Set-builder notation D) subset E) proper subset
F) equal sets G) null set H) union of sets I) intersection of sets J) integers
K) natural numbers L) rational numbers

Part II Given: $A = \left\{\sqrt[3]{-8},\ -\sqrt{3},\ 10,\ 3.14,\ 7^2,\ 2\frac{1}{2},\ \frac{132}{2}\right\}$, find the subset which contains...

A) natural numbers? B) integers? C) rational numbers? D) irrational numbers?

Given: $A = \left\{1.1,\ -3,\ \sqrt{25},\ \pi,\ \sqrt{7},\ \sqrt[3]{7},\ \frac{5}{3}\right\}$, find the subset which contains...

E) natural numbers? F) integers? G) rational numbers? H) irrational numbers?

Part III Find the solution set of each of the following. Graph the solution on a **number line**.

A) $(x-5)^2 = 10$ B) $5 - \frac{1}{2}x = 7$ C) $x^2 + 8x + 1 = 0$ D) $11 - 2(x+4) = 14(2-x)$
E) $(x-2)^2 = 49$ F) $x(x+3) + 2 = (x+1)(x+2)$ G) $x^2 = x$
H) $x(x+4) = 0$ I) $10x^2 = 8x$ J) $x^2 - 2x = 15$ K) $2x^2 - 4x - 30 = 0$
L) $5 - x^2 = 0$ M) $\dfrac{5x-2}{3} + \dfrac{2x+4}{4} = 2x - 1$ N) $\dfrac{1}{x-3} - \dfrac{1}{x+3} = \dfrac{6}{x^2-9}$
O) $x^2 + x - 2 > 0$ P) $(2x-3)(x+1)(x-2) < 0$
Q) $(2x-3)^2(x+1)(x-2) < 0$ R) $(2x-3)(x+1)^2(x-2) < 0$ S) $(2x-3)(x+1)(x-2)^2 < 0$

Part IV Solve each of the following inequalities. Graph each equation on its own number line.
Show the proper work!

1) $|x+4| + x > 3$ 2) $|x-3| + (x+4) < |-8|$ 3) $|x-3| + |x+4| < 8$
4) $|x| + |x| + x > 12$ 5) $\dfrac{|x-3|}{|x+4|} < 8$ 6) $|-x| + |-x| + 3x - 1 > 5$
7) $|x+2| - |x-3| \geq 3$ 8) $5 - |x-2| \geq 3$ 9) $2x + |3x+1| - |4x-5| \geq -10$
10) $\dfrac{|x+4|}{|x-3|} < 8$ 11) $\dfrac{|2x+1|}{|x-1|} < 2$ 12) $|2x-6| = |4-5x|$
13) $|2x-1| = |4x+3|$ 14) $|x^2| < |-4|$ 15) $|6-2x| > |8|$
16) $\dfrac{|x+1|}{|x-1|} > 2$ 17) $|2x-1| > x$ 18) $|x+4||x-3| < 8$
19) $|2x+5| < x+3$ 20) $|x+1| \cdot |x+1| - x^2 > 2$ 21) $|(x+1)(2x-3)| > 4$

Part V For problems 1 - 6, write as piece-meal functions then sketch the function:

1) $a(x)=|x+2|+|x-1|$ 2) $b(x)=|2x+1|+2|x-1|$ 3) $c(x)=|x-3|+(x+3)$

4) $d(x)=2x-|x-1|$ 5) $e(x)=|x|+|x+1|-|x-1|$ 6) $f(x)=|x+|x+1||$

Graph each function: 7) $f(x)=\begin{cases}x^2 & ;\ -2\le x\le 1\\ 1 & ;\ 1<x\le 2\end{cases}$ 8) $f(x)=\begin{cases}x & ;\ -3\le x<0\\ 1 & ;\ 0<x\le 3\end{cases}$

Part VI

A) $h(x)=f(x)+g(x)$ List the ordered pairs for $h(x)$.

1) $f(x)=\{(1,4),(2,3),(3,2),(4,1)\}$, $g(x)=\{(1,0),(2,2),(3,4),(4,6)\}$

2) $f(x)=\{(-2,4),(-1,2),(0,0),(1,2),(2,4)\}$, $g(x)=\{(-2,2),(-1,1),(0,0),(1,1),(2,2)\}$

B) Find $f+g$, $f\cdot g$, $f(f(x))$, and $f(g(x))$

1) $f(x)=6x+1$; $g(x)=3x$ 2) $f(x)=x^2-1$; $g(x)=(x-1)^2$ 3) $f(x)=\dfrac{x+4}{x-2}$; $g(x)=x-2$

C) Find $f(g(x))$ and $g(f(x))$

1) $f(x)=\sqrt{x}$; $g(x)=5-x$ 2) $f(x)=-x$; $g(x)=x^2$

D) 1. Given $f(x)=x+1$; $f(g(x))=4x-2$ Find $g(x)$.

2. Given $f(x)=x+1$; $g(f(x))=4x-2$ Find $g(x)$.

Given: $f(x)=\{(1,4),\ (2,3),\ (3,2),\ (4,1)\}$ and $g(x)=\{(1,3),\ (2,1),\ (3,4),\ (4,5)\}$

Also Given : $f(x)=f(g(x))$; $i(x)=g(f(x))$; $j(x)=f(f(x))$; $k(x)=g(g(x))$;.

List the ordered pairs in: E) h(x) F) i(x) G) j(x) H) k(x)

Part VII Given $A(x)=\dfrac{x}{x+1}$; $B(x)=\dfrac{x}{2x-1}$; $C(x)=\dfrac{3x+1}{x}$; $D(x)=\dfrac{x-1}{x+5}$ **and**

$H(x)=B(A(x))$; $I(x)=C(A(x))$; $J(x)=D(A(x))$; $K(x)=C(D(x))$; $L(x)=D(C(x))$; $M(x)=A(B(x))$

$N(x)=A(A(x))$; $O(x)=B(B(x))$; $P(x)=C(C(x))$; $Q(x)=D(D(x))$; $R(x)=A(B(C(x)))$

Describe the DOMAIN ONLY for each of the following:

1) *A(x)* 2) *B(x)* 3) *C(x)* 4) *D(x)* 5) *H(x)*

6) *I(x)* 7) *J(x)* 8) *K(x)* 9) *L(x)* 10) *M(x)*

11) *N(x)* 12) *O(x)* 13) *P(x)* 14) *Q(x)* 15) *R(x)*