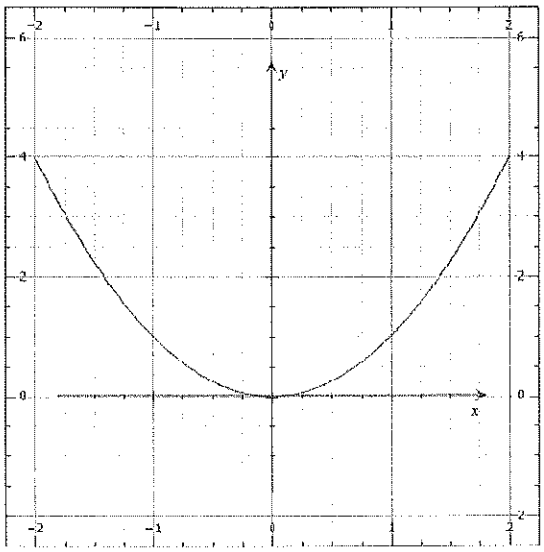
Name Key Algebra II Honors Summer Packet

Please **show all work** on a separate piece of loose leaf to receive full or partial credit. Please write final answers on answer line. Please read directions carefully.

Relations, Functions, Function Notation, Linear Equations and Functions

Questions 1 and 2: Determine whether each relation is a function. State its domain and range

1)

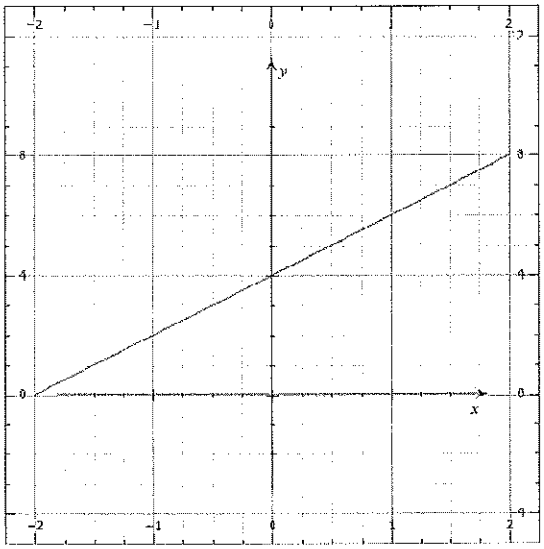


1) Function? Yes or No? Yes

1) Domain: $\mathbb{R}$ or $(-\infty, \infty)$

1) Range: $y \geq 0$ or $[0, \infty)$

2)



2) Function? Yes or No? Yes

2) Domain: $\mathbb{R}$ or $(-\infty, \infty)$

2) Range: $\mathbb{R}$ or $(-\infty, \infty)$

Key

Questions 3-5: Find each value if $f(x)=10x+3x^2$ **and** $g(x)=5x^2-8x$ **and** $h(x)=\frac{1}{x}$.

3) $f(-6)$ 3) $f(-6)=48$

4) $g(a^2)$ 4) $g(a^2)=5a^4-8a^2$

5) $h(0)$ 5) undefined

6) Write the equation $\frac{2}{5}x-8=7y$ in standard form, and identify A, B, and C. (Hint: Standard Form is $Ax+By=C$, where A, B, and C are integers, and $A\geq 0$.)

6) $2x-35y=40$
$A=2 \quad B=-35 \quad C=40$

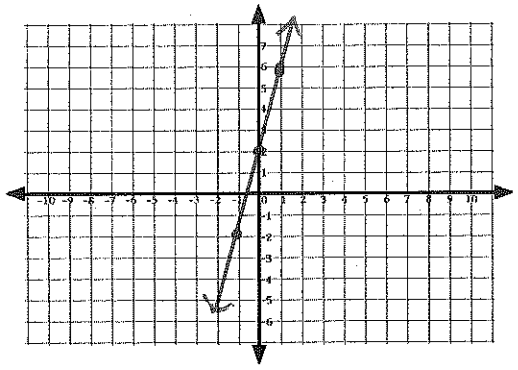
7) Find the x-intercept and the y-intercept of the graph of $2y=3x-6$

7) x-int. $=2$
y-int. $=-3$

For Questions 8-9, graph each equation.

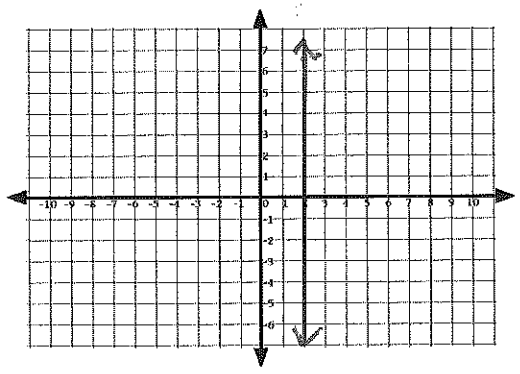
8) $y-4x=2$

8)



9) $x=2$

9)



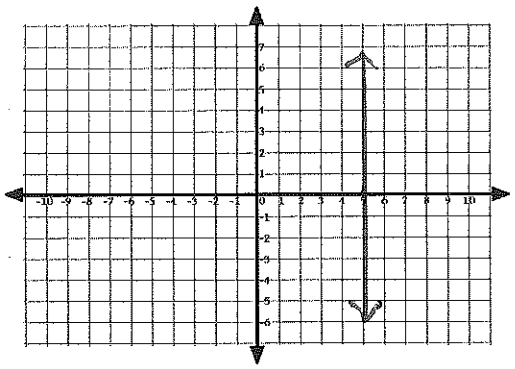
Key

10) Find the slope of a line that passes through $(9,-7)$ and $(-1,-2)$.

10) $m = -\frac{1}{2}$

11) Graph the line passing through $(5,6)$ perpendicular to the graph of $y=-3$.

11)



12) Write the equation in slope-intercept form for the line that has a slope of 3 and passes through the point $(1,-5)$.

12) $y = 3x - 8$

13) Write an equation in slope-intercept form for the line that passes through $(-2,3)$ and is parallel to the line whose equation is $2x+3y=6$.

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

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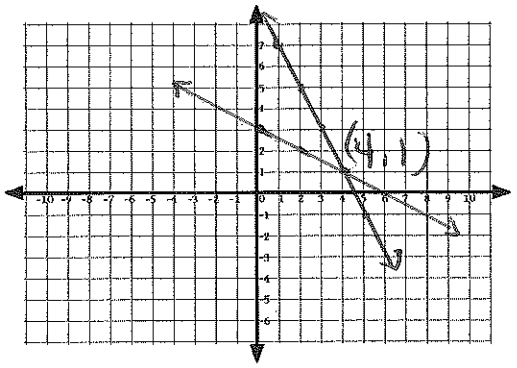
Systems of Equations and Inequalities

For Questions 1-2, solve each system of equations by graphing.

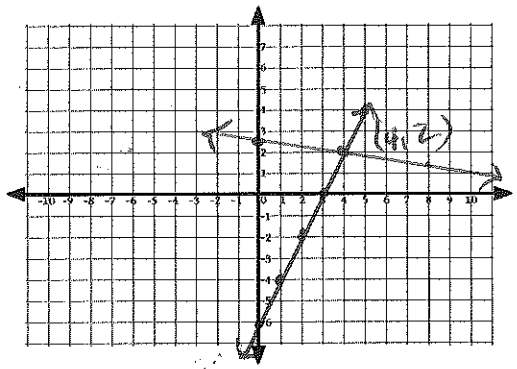
1) $\begin{aligned} x+2y&=6 \\ 2x+y&=9 \end{aligned}$.

1) Solution is: (4, 1)



2) $\begin{aligned} \frac{1}{4}x+2y&=5 \\ 2x-y&=6 \end{aligned}$.

2) Solution is: (4, 2)



For Questions 3 and 4, solve each system by substitution.

3) $\begin{aligned} y&=3x-4 \\ y&=4+x \end{aligned}$

3) (4, 8)

4) $\begin{aligned} 4c+2d&=10 \\ c+3d&=10 \end{aligned}$

4) (1, 3)

Key

For Questions 5 and 6, solve each system by elimination.

5) $x - y = -9$
$7x + 2y = 9$

5) $(-1, 8)$

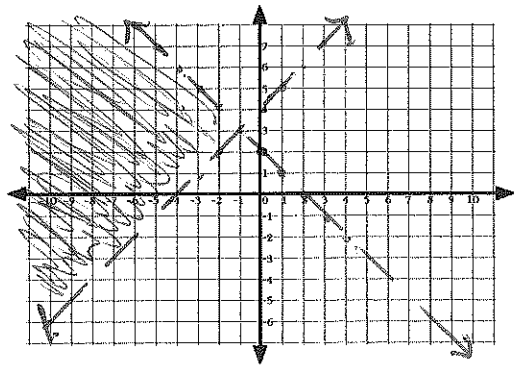
6) $4x - 5y = 17$
$3x + 4y = 5$

6) $(3, -1)$

For Questions 7-8, solve each system of inequalities by graphing.

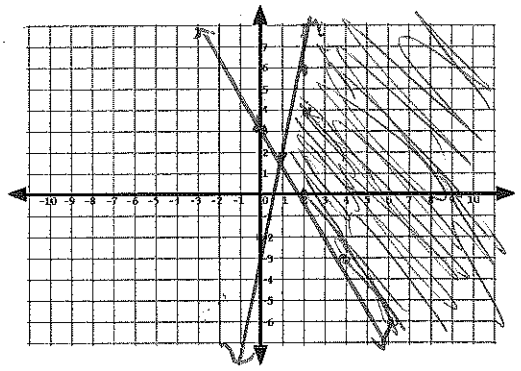
7) $y < 2 - x$
$y > x + 4$

7)



8) $3x + 2y \geq 6$
$4x - y \geq 2$

8)



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Rules of Exponents, Operations on Polynomials, and Factoring Polynomials

For Questions 1-5, simplify completely.

1) $(2x)(5x)$ — 1) $10x^2$

2) $(3x)^2$ — 2) $9x^2$

3) $\left(\frac{x^2}{y^3}\right)^2$ — 3) $\frac{x^4}{y^6}$

4) $\left(\frac{x^2}{y^3}\right)^{-2}$ — 4) $\frac{y^6}{x^4}$

5) $\left(\frac{3a^{-5}x^2}{b^{-6}y^3}\right)^0$ — 5) 1

For Questions 6-9, perform the indicated operation.

6) $(2x^3+3x^2)+(7x^3-2x^2)$ — 6) $9x^3+x^2$

7) $(2x^3+3x^2)-(7x^3-2x^2)$ — 7) $-5x^3+5x^2$

8) $(2x^3+3x^2)(7x^3-2x^2)$ — 8) $14x^6+17x^5-6x^4$

9) $(2x+y)^2$ — 9) $4x^2+4xy+y^2$

Key

For Questions 10-19, factor each polynomial completely.

10) $7x^2 - 14x$ 10) $7x(x-2)$

11) $21x^3 - 18x^2y^2 + 24xy^2$ 11) $3x(7x^2 - 6xy^2 + 8y^2)$

12) $c^2 - 100$ 12) $(c+10)(c-10)$

13) $d^2 - 12d + 36$ 13) $(d-6)^2$

14) $y^2 + 18y + 81$ 14) $(y+9)^2$

15) $a^2 + 7a - 18$ 15) $(a+9)(a-2)$

16) $b^2 + 8b + 7$ 16) $(b+7)(b+1)$

17) $2x^2 - 3x - 5$ 17) $(2x-5)(x+1)$

18) $4z^2 + 4z - 15$ 18) $(2z-3)(2z+5)$

19) $2ak + k - 6a - 3$ 19) $(2a+1)(k-3)$