Algebra II Honors - Algebra I Review Name: _____

1.) Add/subtract the following (without a calculator).

a.) $\frac{3}{5}+\frac{9}{4}=$ b.) $\frac{22}{7}-12=$ c.) $\frac{13}{15}-\frac{3}{10}=$

2.) Multiply/divide the following (without a calculator).

a.) $9\left(\frac{16}{3}\right)=$ b.) $\frac{5}{8}\div\frac{15}{2}=$ c.) $\frac{\frac{4}{7}}{3}=$

3.) Simplify each numerical expression (without a calculator).

a.) $\frac{6\cdot 2-1}{9+2}$ b.) $6\times(4+10\div 2)$ c.) $2+3^2-4\times 5$

4.) Evaluate each expression.

a.) $a-7\cdot 2 \text{ for } a=15$ b.) $2\left(\frac{5d-6}{3}\right) \text{ for } d=9$ c.) $(-2x)^3 \text{ for } x=3$

5.) Evaluate each expression for $x=-3, y=5$ and $z=1$.

a.) $3x+2y-z$ b.) $\frac{y^2+2z}{x}$ c.) z^0-x^3+y

6.) Solve the following equations for x.

a.) $10 = -\frac{x}{2}$ b.) $-5\frac{1}{3} = x + \frac{1}{2}$ c.) $6x = -\frac{1}{4}$

d.) $7 - 3x = 16$ e.) $\frac{x}{5} + 15 = 30$ f.) $14 + \frac{x}{5} = 2$

g) $x - 7 + 3x = 29$ h.) $x - \frac{20}{3} + x = \frac{13}{3}$ i.) $x + x + 2 + 3x - 6 = 31$

j.) $x + 5(x - 1) = 1$ k.) $8x - (2x - 3) = 9$ l.) $\frac{3}{4}(8x - 4) = -2$

m.) $\frac{x}{4} + \frac{3x}{5} = 17$ n.) $\frac{7}{8}x = 14$ o.) $\frac{3x}{2} - \frac{3x}{4} = \frac{3}{2}$

7.) A rectangle has a perimeter of $42\,\text{cm}$. The length is $3\,\text{cm}$ greater than the width. Find the length and width of the rectangle.

8.) Find each percent of change (positive or negative).

a.) \$26 *to* \$20 b.) $21\,\text{in}$ *to* $54\,\text{in}$ c.) \$24000 *to* \$25000

9.) Solve each of the following equations for x.

a.) $4x - 7 = x + 3(5 - x)$ b.) $\frac{3}{4}x = \frac{1}{2} + \frac{2}{3}x$ c.) $-\frac{37}{24} = \frac{x}{6}$

d.) $|x - 2| = 6$ e.) $|7x| = 14$ f.) $12.9 = |3x|$

10.) A truck traveling $45\,\text{mi/h}$ and a train traveling $60\,\text{mi/h}$ cover the same distance. The truck travels $2\,\text{h}$ longer than the train.

a.) How many hours did each travel?

b.) How many miles did each travel?

11.) Solve the following equations for y.

a.) $\frac{x+y}{z} = \frac{w}{4}$ b.) $V = \frac{1}{3}\pi r^2 y$ c.) $ax + by = c$

12.) Solve the following inequalities for x.

a.) $24 < -3x$ b.) $\frac{3}{2}x \geq -45$ c.) $-\frac{3x}{7} \leq -\frac{12}{35}$

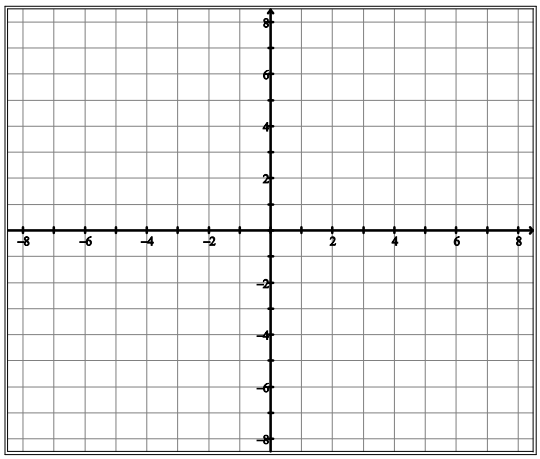
d.) $5 \le 11 + 3x$ e.) $3 + 5x \ge 6(x - 1) - x$ f.) $7 - (9x + 1) > 5$

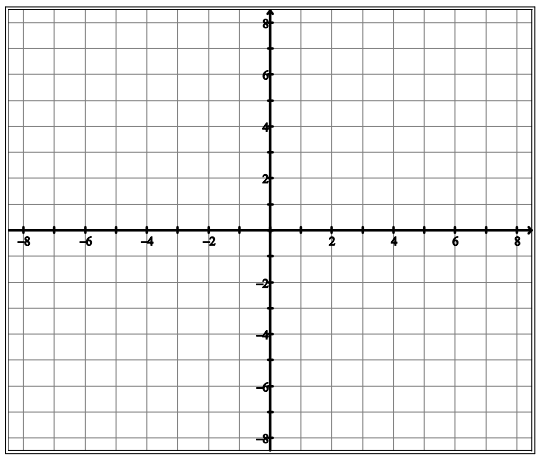
13.) Find the slope of a line passing through each pair of points.

a.) $(8,3);(-4,3)$ b.) $(9,-2);(3,-4)$ c.) $\left(\frac{1}{2},8\right);(1,-2)$

14.) Graph each of the following equations.

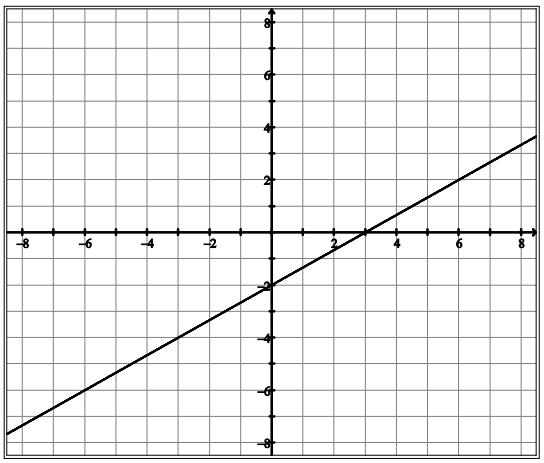
a.) $y = 2x - 1$ b.) $y + \frac{3}{4}x = 2$



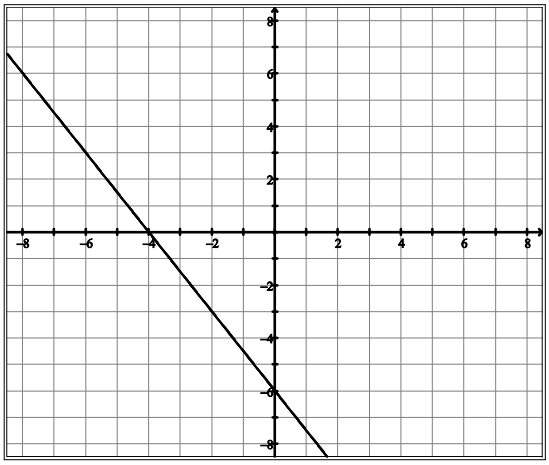


15.) Write a *slope – intercept* form equation for each of the following lines.

a.)



b.)



16.) Write an equation of a line, in slope-intercept form, through the following pairs of points.

a.) $(3,-3);(-3,1)$ b.) $(-8,2);(1,3)$ c.) $(1,-8);(-4,-7)$

17.) a.) Find the equation of a line parallel to $y=-\frac{2}{3}x+12$ going through $(5,-3)$.

b.) Find the equation of a line perpndicular to $y=-4x-\frac{5}{2}$ going through $(1,6)$.

18.) Solve the following systems of equation using *substitution*.

a.) $y=3x+1$
$y=3x-\frac{5}{2}$

b.) $x-3y=1$
$2x+5y=13$

19.) Solve the following systems of equation using *elimination*.

a.) $3x+4y=9$
$-3x-2y=-3$

b.) $3x+4y=6$
$-6x+y=6$

20.) The sum of two numbers is 169. Twice one number plus three times the other number is -4. Write a system of equations to model the problem, and find the two numbers.

21.) There were a total of 153 students and adults at the movie theatre on Friday night. Adult tickets cost $\$9.00$ each and student tickets cost $\$3.50$ each. The theatre collected a total of $\$766.50$ from ticket purchase. How many students attended the movie on Friday night?

22.) Solve the following equations for x.

a.) $x^2 = 49$ b.) $3x^2 - 7 = 41$ c.) $49x^2 - 16 = -7$

23.) Use the *quadratic formula* to solve the following equations for x.

a.) $3x^2 - 3x - 1 = 0$ b.) $x^2 - 12x = 13$

24.) Simplify each of the following expressions (answers must use positive exponents only).

a) $3x^3 \cdot 4x^4$ b.) $(5x^5)(3y^6)(-3x^3y^2)$ c.) $(4x^{-3})(-2x^5)(-x^4)$

d.) $(a^2b^4)^3$ e.) $(4xy^2)^4(2y)^{-3}$ f.) $(2xy)^3(-x^2)^3(-y^3)^2$

g.) $\frac{(2a^7)(3a^2)}{6a^3}$ h.) $\frac{12x^7y^3z^2}{9x^2y^6z^2}$ i.) $\left(\frac{5m^3n}{m^5}\right)^{-2}$

25.) Find the distance and mid-point between $A(4,-3)$ and $B(8,-6)$.

26.) Simplify each radical expression.

a.) $5\sqrt{320}$ b.) $\sqrt{12}\cdot\sqrt{75}$ c.) $\sqrt{\frac{120}{121}}$

d.) $\sqrt{12x^3y^2}$ e.) $\sqrt{\frac{18x}{81}}$ f.) $\sqrt{20a^6b^5c^9}$

g.) $2\sqrt{12}-7\sqrt{3}$ h.) $3\sqrt{7}-\sqrt{28}$ i.) $\sqrt{2}\left(\sqrt{8}-4\right)$

j.) $3\sqrt{10}\left(\sqrt{10}+4\sqrt{5}\right)$ k.) $\dfrac{\sqrt{50}+\sqrt{32}}{\sqrt{2}}$ l.) $\sqrt{(x+3)^2}$

27.) Solve each radical equation.

a.) $\sqrt{5x+10}=5$ b.) $\sqrt{x}=\dfrac{7}{8}$ c.) $20=\sqrt{x}-5$

d.) $\sqrt{3x+1}=\sqrt{x}$ e.) $\sqrt{7x+5}=\sqrt{x-3}$ f.) $\dfrac{x}{2}=\sqrt{3x}$

g.) $x=\sqrt{x+2}$ h.) $\sqrt{2x-15}=\dfrac{x}{4}$

28.) Simplify the following polynomials - write answers in standard form.

a.) $(3-2x+3x^2)+(7+6x-2x^2)$ b.) $(-2x^2+x-6)-(1+2x-4x^2)$

c.) $-4w^2(3w^2+3-4w)$ d.) $x^2(x+1)-x(x^2-1)$

29.) Factor the following polynomials (GCF).

a.) $6m^6 - 24m^4 + 6m^2$ b.) $15k^3 + 3k^2 - 12k$ c.) $56x^4 - 32x^3 - 2x^2$

30.) Find each product (FOIL).

a.) $(x+3)(x+5)$ b.) $(2z+5)(z-3)$ c.) $(2x+1)(3x+4)$

d.) $\left(\sqrt{3}+\sqrt{2}\right)\left(\sqrt{3}-\sqrt{2}\right)$ e.) $(2x-3)^2$ f.) $(x+3)(x^2-2x-8)$

31.) Factor the following trinomials into a product of two binomials (un-FOIL).

a.) $x^2 + 6x + 8$ b.) $x^2 - 7x + 12$ c.) $x^2 - 2x - 24$

d.) $2x^2 - 15x + 7$ e.) $3x^2 + 13x - 10$ f.) $6x^2 + 13x - 5$

32.) If $a^2 + b^2 = 9$ and $ab = 6$, what does $(a+b)^2$ equal?

33.) Solve the following equations by factoring.

a.) $x^2 + 3x - 4 = 0$

b.) $z^2 - 5z = -6$

c.) $6x^2 + 12x + 13 = 2x^2 + 4$

d.) $-8x^2 - 20x = 0$

e.) $x^3 - 10x^2 + 24x = 0$

f.) $x^2 - 13x - 48 = 0$

g.) $7x^2 + 22x + 26 = x^2 - 12x - 22$

34.) Simplify each expression - factor and cancel.

a.) $\frac{2x^2 + 2x}{3x^2 + 3x}$

b.) $\frac{3x^2 - 9x}{x - 3}$

c.) $\frac{x^2 + 2x + 1}{x + 1}$

d.) $\frac{7}{3x} + \frac{2}{5x}$

e.) $\frac{3}{8m^3} + \frac{1}{12m^2}$

f.) $\frac{17}{x + 1} + \frac{12}{x - 1}$

g.) $\frac{4}{x - 5} - \frac{3}{x + 5}$

h.) $\frac{5}{x + 2} + \frac{4}{x^2 - x - 6}$

i.) $\frac{1}{x - 2} - \frac{4}{2 - x}$