

Algebra 2 H Review (Midterm)

$$(1) \quad 4\sqrt{4 \cdot 3} - 8\sqrt{9 \cdot 3}$$

$$8\sqrt{3} - 24\sqrt{3} = \boxed{-16\sqrt{3}}$$

$$(2) \quad \sqrt{4 \cdot 14 \cdot a^2 \cdot a \cdot b^4 \cdot b \cdot c^4 \cdot c^2}$$

$$\boxed{2ab^2c^3\sqrt{14ab}}$$

$$(4) \quad \frac{2x+1}{4} - \frac{x+3}{3} = \frac{10}{12}$$

$$6x+3-(4x+12)=10$$

$$6x+3-4x-12=10$$

$$2x-9=10$$

$$2x=19$$

$$x = \boxed{\frac{19}{2}}$$

common denominator is 12

$$(3) \quad 5\sqrt{25} - 5\sqrt{15} + 1\sqrt{15} - \sqrt{9}$$

$$25 - 4\sqrt{15} - 3$$

$$\boxed{22 - 4\sqrt{15}}$$

$$(6) \quad -10x+5=3x+12-2$$

$$-13x=5$$

$$x = \boxed{-\frac{5}{13}}$$

$$(5) \quad \frac{1}{2}x - \frac{5}{3} = -\frac{1}{2}x + \frac{19}{4}$$

$$6x-20=-6x+57$$

$$12x=77$$

$$x = \boxed{\frac{77}{12}}$$

$$\frac{77}{12}$$

common denominator is 12

$$(8) \quad A = \frac{1}{2}h(b_1+b_2)$$

$$\frac{2A}{h} - b_2 = b_1$$

$$\boxed{b_1 = \frac{2A}{h} - b_2}$$

$$(7) \quad \frac{3}{4} + 3x+3 = \frac{10x}{4} + \frac{25}{4}$$

$$\frac{3x}{1} - \frac{10x}{4} = \frac{25}{4} - \frac{3}{4} - \frac{3}{1}$$

$$12x-10x=25-3-12$$

$$2x=10$$

$$x = \boxed{5}$$

common denominator is 4

$$(9) \quad 2|2x-6|-8=12$$

$$2|2x-6|=20$$

$$|2x-6|=10$$

$$2x-6=10 \quad 2x-6=-10$$

$$\boxed{x=8 \text{ OR } x=-2}$$

$$(10) \quad 5x-2 > 10 \text{ or } 5x-2 < -10$$

$$x > \frac{12}{5} \text{ OR } x < -\frac{8}{5}$$

$$\boxed{(-\infty, -\frac{8}{5}) \cup (\frac{12}{5}, \infty)}$$

$$(11) \quad 3a < -3 \quad 3a > 6$$

$$a < -1 \text{ OR } a > 2$$

$$\boxed{(-\infty, -1) \cup (2, \infty)}$$

$$(12) 5(x+2) > x-5$$

$$5x+10 > x-5$$

$$4x > -15$$

$$x > \frac{-15}{4}$$

$$\left(-\frac{15}{4}, \infty\right)$$

$$(13) 3x+4 \leq 2 \text{ and } 3x+4 \geq -2$$

$$3x \leq -2$$

$$3x \geq -6$$

$$x \leq -\frac{2}{3} \text{ and } x \geq -2$$

$$\left[-2, -\frac{2}{3}\right]$$

$$(14) f(2) = \boxed{10}$$

$$g(-3) = \boxed{4}$$

$$(15) \frac{5-2}{3+6} = \frac{3}{9} = \boxed{\frac{1}{3}}$$

$$(16) x-3y = -6$$

$$\frac{-3y}{-3} = \frac{-x-6}{-3}$$

$$y = \frac{1}{3}x + 2$$

need equation perpendicular

to but goes thru

our slope is -3 thru (-2, 5)

$$y = mx + b$$

$$5 = -3(-2) + b$$

$$5 = 6 + b$$

$$b = -1$$

$$y = -3x - 1$$

$$\boxed{3x + y = -1}$$

$$(17) x-4y = 2$$

$$\frac{-x}{-4} = \frac{-x+2}{-4}$$

$$-4y = -x + 2$$

$$y = \frac{1}{4}x - \frac{1}{2}$$

slope is $\frac{1}{4}$ thru (2, 10)

$$10 = \frac{1}{4}(2) + b$$

$$10 = \frac{1}{2} + b$$

$$b = 9\frac{1}{2} = \frac{19}{2}$$

$$\boxed{y = \frac{1}{4}x + \frac{19}{2}}$$

$$(18) \frac{2+8}{8-3} = \frac{10}{5} = 2 \text{ slope}$$

$$y-2 = 2(x-8) \text{ point slope form}$$

$$y-2 = 2x-16$$

$$\boxed{y = 2x - 14}$$

$$y = 2x - 14$$

$$(19) 1 = 3(-4) + b$$

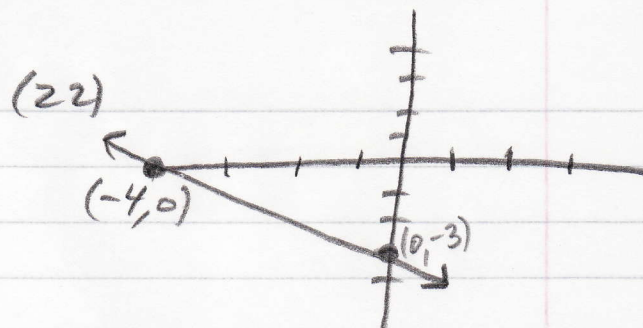
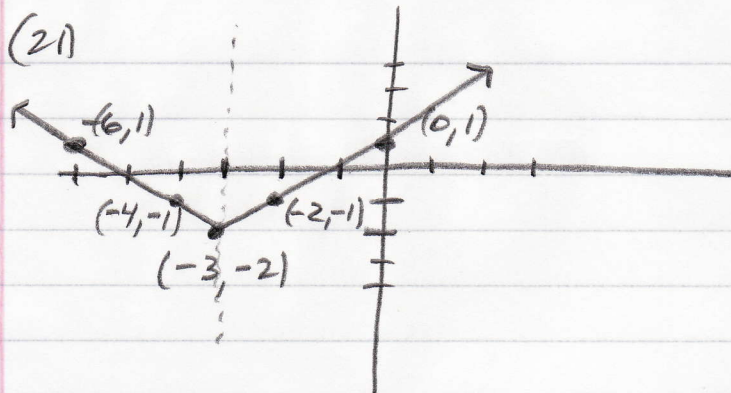
$$1 = -12 + b$$

$$b = 13$$

$$\boxed{y = 3x + 13}$$

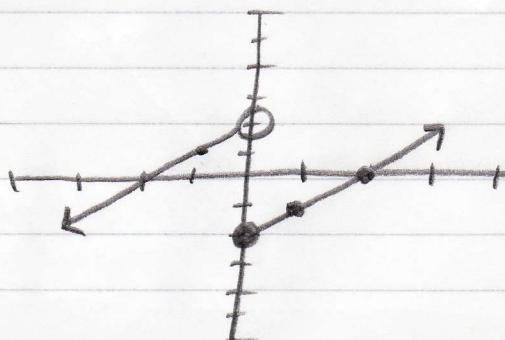
$$(20) x\text{-intercept: } (3, 0)$$

$$y\text{-intercept: } (0, 4)$$



(23) Interval of decrease $(-\infty, \infty)$

(24) $0, -2 \geq$
 $0, 2 <$



(25) $-12x + 10y = 8$
 $7x - 10y = -8$

 $-5x = 0$
 $x = 0$
 $y = \frac{4}{5}$

(26) $3x + 2y = -3$
 $-3x - y = 12$

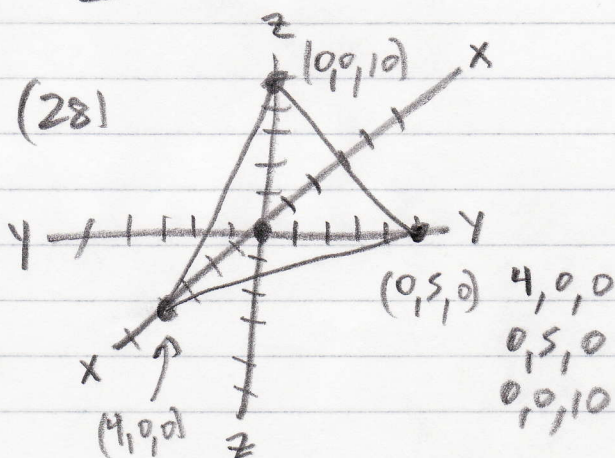
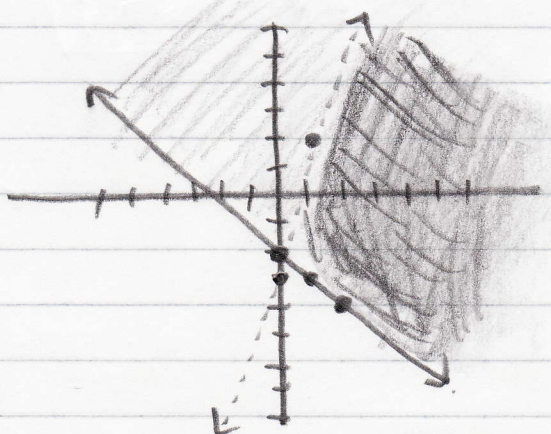
 $y = 9$

$3x + 2(9) = -3$
 $3x = -21$
 $x = -7$

$(-7, 9)$

$(-7, 9)$

(27) $x + y \geq -2 \rightarrow y \geq -x - 2$
 $-5x + y \leq -3 \rightarrow y \leq 5x - 3$



$$(29) \textcircled{1} 9a + 7b + 0c = -30$$

$$\textcircled{2} 0a + 8b + 5c = 11$$

$$\textcircled{3} -3a + 0b + 10c = 73$$

$$8(-3) + 5c = 11$$

$$-24 + 5c = 11$$

$$5c = 35$$

$$c = \textcircled{7}$$

$$9a + 7(-3) = -30$$

$$9a - 21 = -30$$

$$9a = -9$$

$$a = \textcircled{-1}$$

$$\textcircled{1} 9a + 7b + 0c = -30$$

$$3\textcircled{3} -9a + 0b + 30c = 219$$

$$\textcircled{4} 7b + 30c = 189$$

$$-6\textcircled{2} -48b - 30c = -66$$

$$-41b = 123$$

$$-41 \quad -41$$

$$b = \textcircled{-3}$$

$$\begin{array}{l} a = -1 \\ b = -3 \\ c = 7 \end{array}$$

$$(30) -1(5) - (4) - 3 = -5 + 12 = \textcircled{7}$$

$$(31) \begin{array}{ccccc} 1 & 1 & 3 & 1 & 1 \\ -2 & 0 & 2 & -2 & 0 \\ 5 & -1 & -4 & 5 & -1 \end{array} = (0 + 10 + 6) - (0 - 2 + 8)$$

$$16 - 6 = \textcircled{10}$$

$$(32) 2 \times 4$$

$$(33) [(4 + 2x) + 8] - [(x - 1)(3)] = 10$$

$$-32 - 16x - 3x + 3 = 10$$

$$-29 - 19x = 10$$

$$-19x = 39$$

$$x = \textcircled{-\frac{39}{19}}$$

(34) coefficient matrix $\begin{bmatrix} 8 & 0 & -6 \\ 2 & -5 & 3 \\ 1 & 10 & -4 \end{bmatrix}$

constant matrix $= \begin{bmatrix} 38 \\ 5 \\ 8 \end{bmatrix}$

$\det A = \begin{vmatrix} 8 & 0 & -6 & 8 & 0 \\ 2 & -5 & 3 & 2 & -5 \\ 1 & 10 & -4 & 1 & 10 \end{vmatrix} = [160 + 0 - 120] - [30 + 240 + 0]$
 $40 - 270 = \boxed{-230}$

$x = \begin{array}{r} 38 \ 0 \ -6 \\ 5 \ -5 \ 3 \\ 8 \ 10 \ -4 \\ \hline -230 \end{array}$

$y = \begin{array}{r} 8 \ 38 \ -6 \\ 2 \ 5 \ 3 \\ 1 \ 8 \ -4 \\ \hline -230 \end{array}$

$z = \begin{array}{r} 8 \ 0 \ 38 \\ 2 \ -5 \ 5 \\ 1 \ 10 \ 8 \\ \hline -230 \end{array}$

(35) $\begin{bmatrix} 2 & 1 & 1 \\ 5 & 3 & 1 \\ 7 & 1 & 1 \end{bmatrix} \begin{bmatrix} 2 & 1 \\ 5 & 3 \\ 7 & 1 \end{bmatrix} =$