Algebra 2 Name_____ ID: 1

Chapter 1 Review for Final

Date_____ Period____

Identify a pattern and find the next three numbers in the pattern.

1) -4, -1, 2, 5... $\boxed{8, 11, 14}$

+3 +3 +3

2) 3, 21, 147, 1029... 7203, 50421, 352947

×7 ×7 ×7

State what sets of numbers the following numbers belong to.

3) -10 integer, rational, real

4) $-\frac{3}{4}$ rational, real

5) π irrational, real

6) $\sqrt{2}$ irrational, real

Simplify the expressions given that $a = 3$, $b = -4$ and $c = -10$

7) $2a + 3b$

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

$\boxed{-6}$

8) $-c + 2(a + b)$

$-(-10) + 2(3 + -4)$

$\boxed{8}$

9) $-b^2 + a(c - 8)$

$-(-4)^2 + 3(-10-8)$ $\boxed{-70}$

10) $a^2 + 2b^2 - c^2$

$3^2 + 2(-4)^2 - (-10)^2$

$9 + 32 - 100$ $\boxed{-59}$

Solve each equation.

11) $-2(7 - x) = 2$

$-14 + 2x = 2$

$2x = 16$

$\boxed{x = 8}$

12) $-19 = -2(8 + n) + 3n$

$-19 = -16 - 2n + 3n$

$-19 = -16 + n$

$\boxed{-3 = n}$

13) $2(1 + 7b) = -33 + 7b$

$2 + 14b = -33 + 7b$

$7b = -35$

$\boxed{b = -5}$

14) $-8(2v - 5) = 8(4 - 3v) + 8v$

$-16v + 40 = 32 - 24v + 8v$

$8 = 0v$ $8 = 0$

no solution

15) $|-2 - 3n| + 2 = 10$

$|-2-3n| = 8$

$-2-3n = 8$ $-2-3n = -8$

$-3n = 10$ $-3n = -6$

$\boxed{n = -\frac{10}{3}, 2}$

16) $|2 - 4a| = 38$

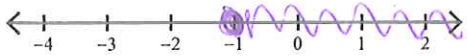
$2-4a = 38$ $2-4a = -38$

$-4a = 36$ $-4a = -40$

$\boxed{a = -9, 10}$

Solve each inequality and graph its solution.

17) $3(5k+5) \geq 0$



$15k + 15 \geq 0$

$15k \geq -15$

$k \geq -1$

18) $-(3p+2) + 5p \geq -16$

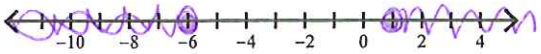
$-3p - 2 + 5p \geq -16$

$2p \geq -14$

$p \geq -7$

Solve each compound inequality and graph its solution.

19) $5x \geq 5$ or $x + 4 \leq -2$



$5x \geq 5$ $\quad$ $x + 4 \leq -2$

$x \geq 1$ or $x \leq -6$

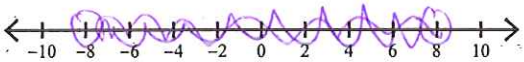
20) $-54 \leq 6n \leq -48$

$-54 \leq 6n$ and $6n \leq -48$

$-9 \leq n$ and $n \leq -8$

Solve each inequality and graph its solution.

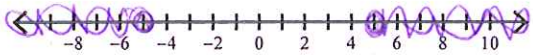
21) $\left|\frac{x}{2}\right| < 4$



$\frac{x}{2} < 4$ $\quad$ $\frac{x}{2} > -4$

$x < 8$ $\quad$ $x > -8$

22) $|4x| - 7 \geq 13$



$4x \geq 20$ $\quad$ $4x \leq -20$

$x \geq 5$ $\quad$ $x \leq -5$

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Chapter 2- Review for Final

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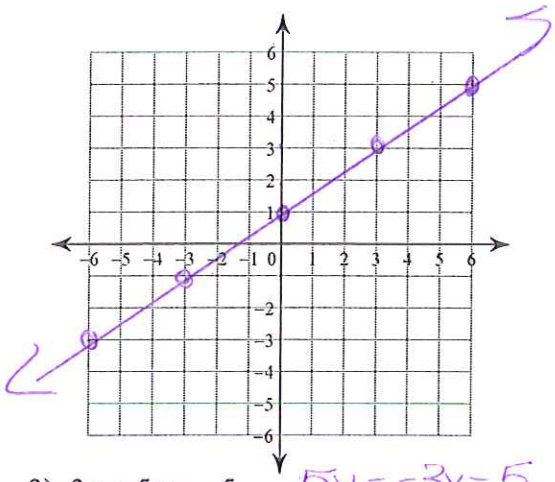
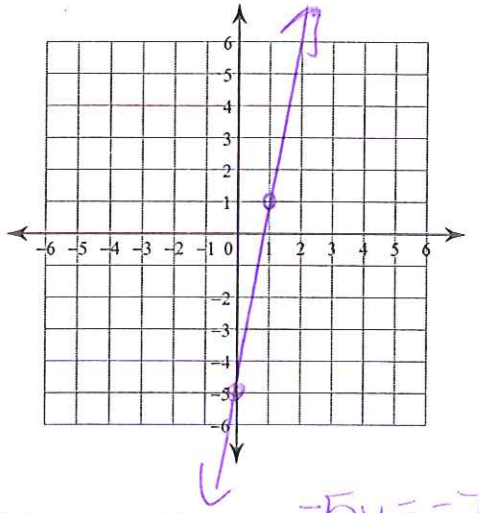
Sketch the graph of each line.

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



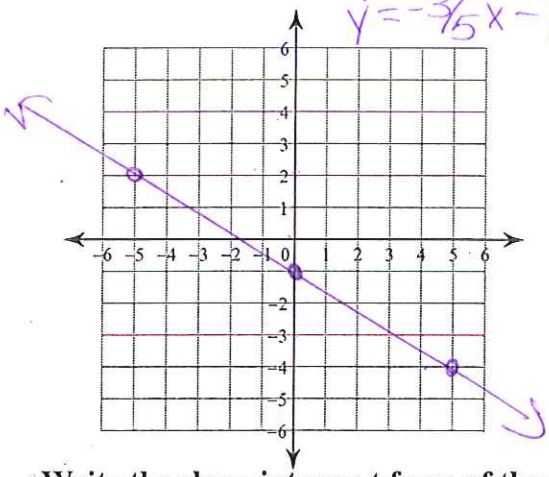
2) $y = 6x - 5$



3) $3x + 5y = -5$

$5y = -3x - 5$

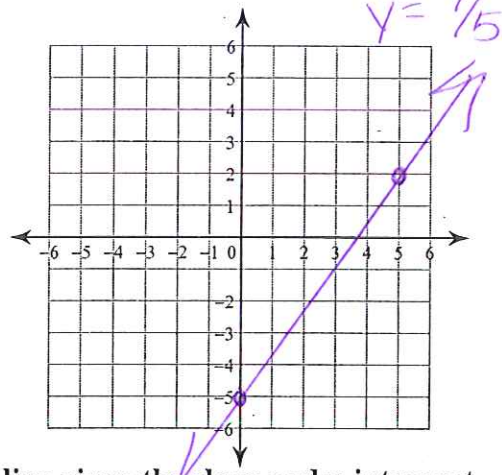
$y = -\frac{3}{5}x - 1$



4) $7x - 5y = 25$

$-5y = -7x + 25$

$y = \frac{7}{5}x - 5$



Write the slope-intercept form of the equation of each line given the slope and y-intercept.

5) Slope = 3, y-intercept = –3

$y = 3x - 3$

6) Slope = –2, y-intercept = –2

$y = -2x - 2$

Write the slope-intercept form of the equation of each line.

7) $5x + 3y = -15$

$3y = -5x - 15$

$y = -\frac{5}{3}x - 5$

8) $8x - 7y = 14$

$-7y = -8x + 14$

$y = \frac{8}{7}x - 2$

Write the slope-intercept form of the equation of the line through the given point with the given slope.

9) through: $(5, 3)$, slope $= \frac{8}{5}$

$y - 3 = \frac{8}{5}(x - 5)$

$y - 3 = \frac{8}{5}x - 8$

$\boxed{y = \frac{8}{5}x - 5}$

10) through: $(-3, -3)$, slope $= -\frac{2}{3}$

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

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

$\boxed{y = -\frac{2}{3}x - 5}$

Write the slope-intercept form of the equation of the line through the given points.

11) through: $(-1, -4)$ and $(0, 2)$

$m = \frac{2+4}{0+1} = \frac{6}{1}$

$\boxed{y = 6x + 2}$

12) through: $(0, -1)$ and $(-4, -2)$

$m = \frac{-2+1}{-4-0} = \frac{-1}{-4} = \frac{1}{4}$

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

Write the point-slope form of the equation of the line described.

13) through: $(-2, 1)$, parallel to $y = \frac{3}{2}x - 5$

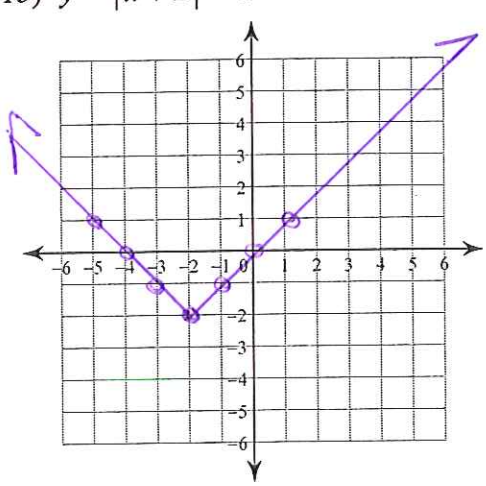
$\boxed{y - 1 = \frac{3}{2}(x + 2)}$

14) through: $(-2, 5)$, perp. to $y = \frac{3}{5}x - 3$

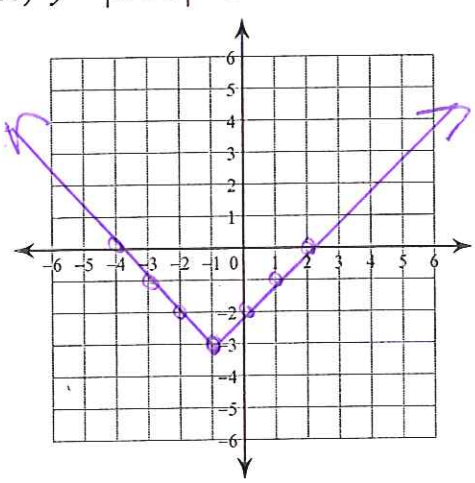
$\boxed{y - 5 = -\frac{5}{3}(x + 2)}$

Graph each equation.

15) $y = |x + 2| - 2$

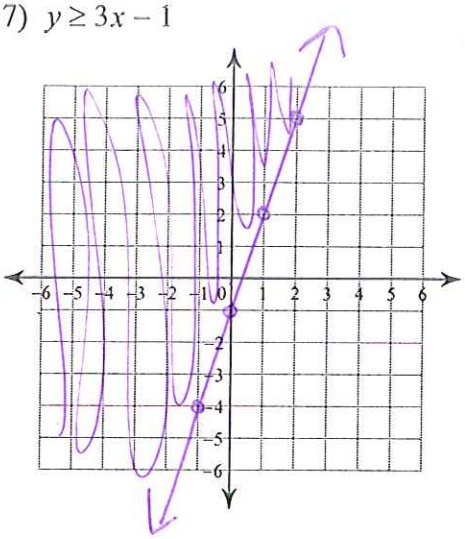


16) $y = |x + 1| - 3$

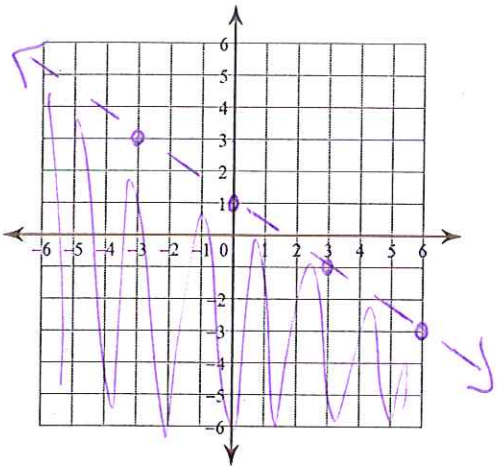


Sketch the graph of each linear inequality.

17) $y \geq 3x - 1$



18) $y < -\frac{2}{3}x + 1$



Evaluate each function.

19) $g(x) = -x^2 + x$; Find $g(5)$

$g(5) = -(5)^2 + 5$

$\boxed{g(5) = -20}$

20) $h(n) = -2n - 4$; Find $h(7)$

$h(7) = -2(7) - 4$

$h(7) = -14 - 4$

$\boxed{h(7) = -18}$

Determine if the following relations are functions.

21) {(2, 4), (7, -11), (8, 6), (7, 14)}

no because the input 7 has 2 outputs, -11 & 14

22) {(1, -3), (4, 9), (-16, -3), (11, 56)}

yes because each input has exactly one output.

Write an expression to model the following situations.

23) A tree is five feet tall and grows 2 feet each year.

$5 + 2x$

24) Jill has 25 dollars and spends 3 dollars a day on lunch.

$25 - 3x$

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Chapter 3- Review for Final

Date_____ Period____

Solve each system by substitution.

1) $6x + 5y = -7$
$x - 8y = -10$

$x = \boxed{8y - 10}$

$6(8y-10)+5y=-7$
$48y-60+5y=-7$
$53y=53$
$y=1$

$x=8(1)-10$
$x=-2$

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

Solve each system by elimination.

2) $10x - 2y = 20$
$20x - 10y = 10$

$-2(10x-2y=20)$
$-20x+4y=-40$
$-6y=-30$
$y=5$

$10x-2(5)=20$
$10x=30$
$x=3$

$\boxed{(3,5)}$

3) $6x + 4y = 2$
$-9x + 3y = -12$

$3(6x+4y=2)$
$4(-9x+3y=-12)$
$-18x-12y=-6$
$-36x+12y=-48$
$-54x=-54$
$x=1$

$6(1)+4y=2$
$4y=-4$
$y=-1$

$\boxed{(1,-1)}$

4) $-6x + 3y - 6z = -21$ ①
$-x + 6y + 3z = -19$ ②
$5x - 6y - z = 17$ ③

$2(-6x+3y-6z=-21)$ ①
③ $5x-6y-z=17$
$-12x+6y-12z=-42$
④ $-7x-13z=-25$

② $-x+6y+3z=-19$
③ $5x-6y-z=17$
⑤ $4x+2z=-2$

$4(-7x-13z=-25)$ ④
$7(4x+2z=-2)$ ⑤

$-28x-52z=-100$
$28x+14z=-14$
$-38z=-114$
$z=3$

⑤ $4x+2(3)=-2$
$4x+6=-2$
$4x=-8$
$x=-2$

② $-(-2)+6y+3(3)=-19$
$6y=-30$
$y=-5$

$\boxed{(-2,-5,3)}$

5) $6x + 5y + 4z = 6$
$-2x - y - 4z = 10$
$4x + 5y + 4z = 2$

① $6x+5y+4z=6$
② $-2x-y-4z=10$
④ $4x+4y=16$

② $-2x-y-4z=10$
③ $4x+5y+4z=2$
⑤ $2x+4y=12$

④ $4x+4y=16$
⑤ $-2x-4y=-12$
$2x=4$
$x=2$

⑤ $2(2)+4y=12$
$4y=8$
$y=2$

② $-2(2)-2-4z=10$
$-6-4z=10$
$-4z=16$
$z=-4$

$\boxed{(2,2,-4)}$

6) Carlos and Molly are selling fruit for a school fundraiser. Customers can buy small boxes of tangerines and large boxes of tangerines. Carlos sold 7 small boxes of tangerines and 12 large boxes of tangerines for a total of \$270. Molly sold 6 small boxes of tangerines and 2 large boxes of tangerines for a total of \$74. Find the cost each of one small box of tangerines and one large box of tangerines.

x = cost of a small box
y = cost of a large box

$7x+12y=270$
$-6(6x+2y=74)$
$-36x-12y=-444$
$-29x=-174$ $x=6$

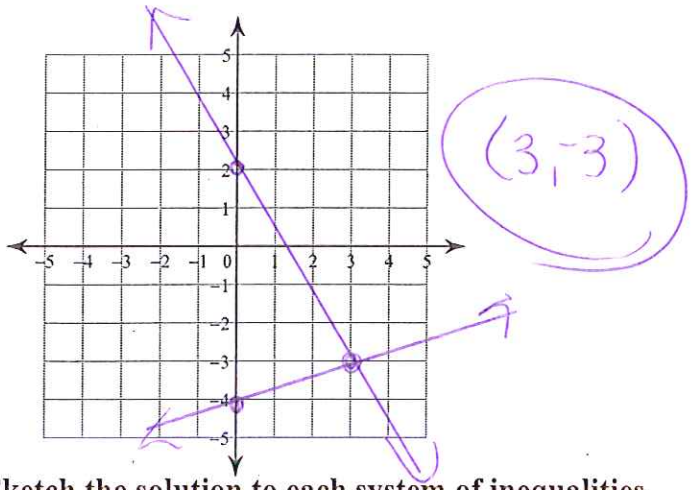
$7(6)+12y=270$
$12y=228$
$y=19$

$\boxed{\text{a small box costs \$6 and a large box costs \$19}}$

Solve each system by graphing.

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

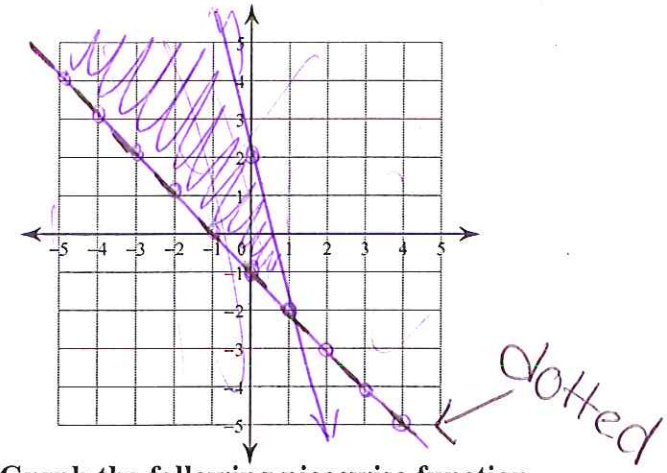
$y = \frac{1}{3}x - 4$



Sketch the solution to each system of inequalities.

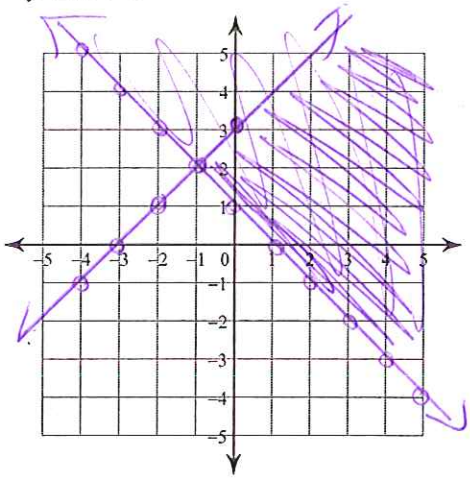
8) $y \le -4x + 2$

$y > -x - 1$



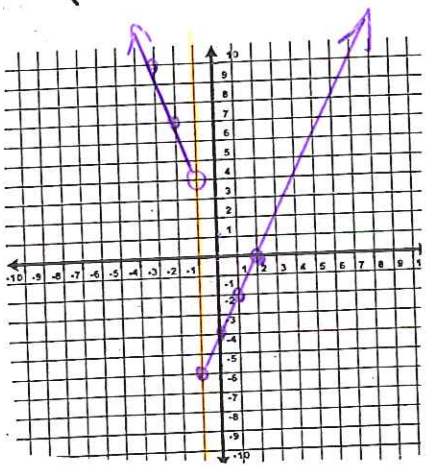
9) $y \ge -x + 1$

$y \le x + 3$

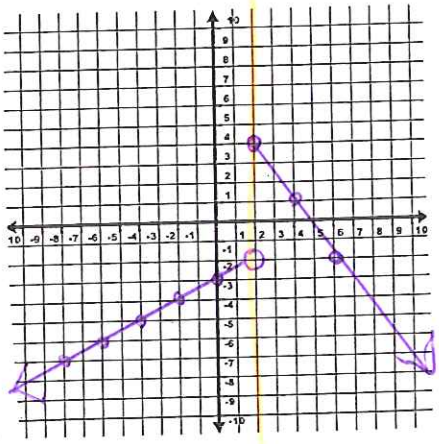


Graph the following piecewise function.

10) $f(x) = \begin{cases} -3x + 1 & \text{when } x < -1 \\ 2x - 4 & \text{when } x \ge -1 \end{cases}$



11) $f(x) = \begin{cases} \frac{1}{2}x - 3 & \text{when } x < 2 \\ -\frac{3}{2}x + 7 & \text{when } x \ge 2 \end{cases}$



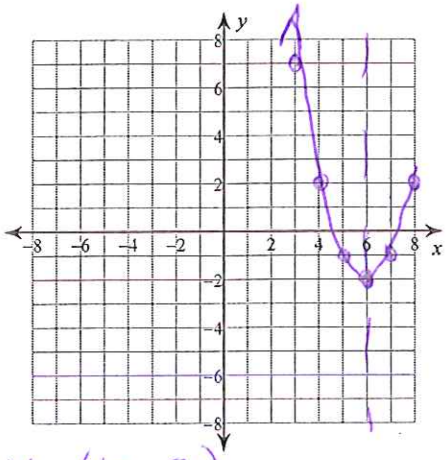
Algebra 2 Name_____ ID: 1

Chapter 4 Review for FINAL

Date_____ Period____

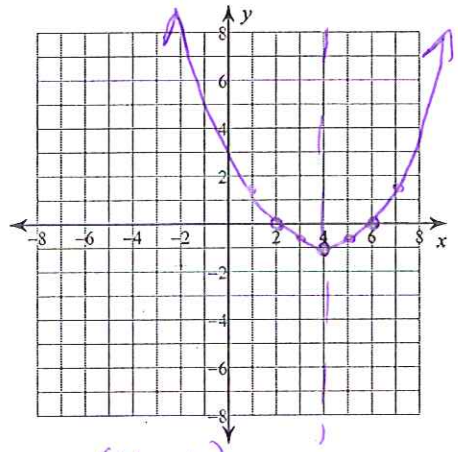
Identify the vertex, axis of symmetry, domain, range, and direction of opening of each. Then sketch the graph.

1) $y = (x-6)^2 - 2$



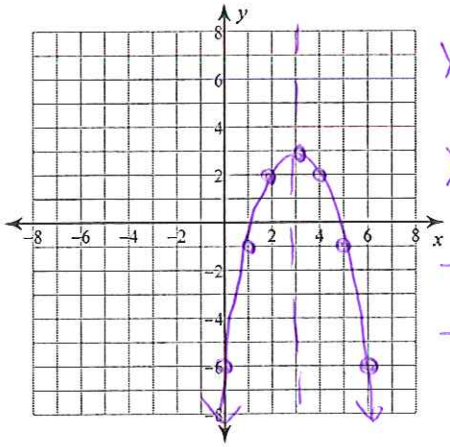
V: (6,-2)
AOS: X=6
D: ℝ or (-∞,∞)
R: y≥-2 or [2,∞)
open: up

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



V: (4,-1)
AOS: X=4
D: (-∞,∞) or ℝ
R: [-1,∞) or y≥-1
open: up

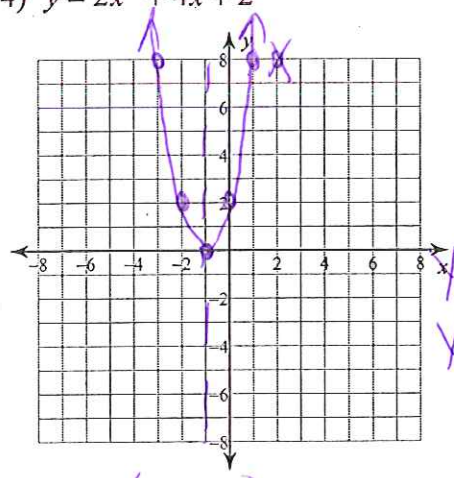
3) $y = -x^2 + 6x - 6$



$X = \frac{-6}{2(-1)}$
X=3
$-(3)^2+6(3)-6$
$-9+18-6$

V: (3,3)
aos: X=3
D: (-∞,∞) or ℝ
R: (-∞,3] or y≤-3
open: down

4) $y = 2x^2 + 4x + 2$



$X = \frac{-4}{2(2)}$
X=-1
$Y=2(-1)^2+4(-1)+2$
Y=2-4+2
Y=0

V: (-1,0)
aos: X=-1
D: (-∞,∞) or ℝ
R: [0,∞) or y≥0
open: up

Solve each equation by factoring.

5) $x^2 + 5x - 14 = 0$

$(x+7)(x-2)=0$

$\boxed{x=-7,2}$

6) $3n^2 - 27n = -54$

$3n^2-27n+54=0$

$3(n^2-9n+18)=0$

$3(n-6)(n-3)=0$

$\boxed{n=6,3}$

7) $15r^2 + 19r - 56 = 0$

Mult -840

Add: 19

$40, -21$

$(15r^2+40r)+(-21r-56)$

$5r(3r+8)-7(3r+8)=0$

$(5r-7)(3r+8)=0$

$5r-7=0 \quad 3r+8=0$

$\boxed{\{7/5, -8/3\}}$

8) $3x^2 - 8x - 16 = 0$

Mult: -48

Add: -8

$-12, 4$

$(3x^2-12x)+(4x-16)=0$

$3x(x-4)+4(x-4)=0$

$(x-4)(3x+4)=0$

$\boxed{x=4, -4/3}$

9) $6b^2 - 12b = 0$

$6b(b-2)=0$

$6b=0 \quad b-2=0$

$\boxed{b=0,2}$

10) $6b^2 + 9 = 177$

$-9 \quad -9$

$6b^2=168$

$b^2=28$

$b=\pm\sqrt{28}$

$\sqrt{4\cdot 7}$

$\boxed{b=\pm 2\sqrt{7}}$

Solve each equation by completing the square.

11) $v^2 - 20v - 79 = -10$

$v^2-20v+\underline{(-10)^2}=69+\underline{100}$

$\sqrt{(v-10)^2}=\pm\sqrt{169}$

$v-10=\pm 13$

$+10 \quad +10$

$\boxed{v=23,-3}$

Find all zeros.

12) $f(x) = 5x^2 - 24x - 5$

Mult: -25

Add: -24

$-25, 1$

$(5x^2-25x)+(x-5)$

$5x(x-5)+1(x-5)$

$(5x+1)(x-5)=0$

$\boxed{\{-1/5, 5\}}$

Solve each equation with the quadratic formula.

13) $8m^2 + 11 = 8m$

$8m^2-8m+11=0$

$x=\dfrac{8\pm\sqrt{(-8)^2-4(8)(11)}}{2(8)}$

$x=\dfrac{8\pm\sqrt{-288}}{16} \rightarrow \sqrt{-144\cdot 2}$

$x=\dfrac{8\pm 12i\sqrt{2}}{16}$

$\boxed{x=\dfrac{2\pm 3i\sqrt{2}}{4}}$

14) $10a^2 + 7 = 8a$

$10a^2-8a+7=0$

$x=\dfrac{8\pm\sqrt{(-8)^2-4(10)(7)}}{2(10)}$

$x=\dfrac{8\pm\sqrt{-216}}{20}$

$x=\dfrac{8\pm 6i\sqrt{6}}{20}$

$\boxed{x=\dfrac{4\pm 3i\sqrt{6}}{10}}$

Simplify.

15) $(-6-3i)+(5-8i)$

$-6-3i+5-8i$

$\boxed{-1-11i}$

16) $(2+7i)-(7-i)$

$2+7i-7+i$

$\boxed{-5+8i}$

17) $(8i)(i)(-4+4i)$

$8i^2$

$-8(-4+4i)$

$\boxed{32-32i}$

18) $(7+4i)^2$

$(7+4i)(7+4i)$ (-1)

$49+28i+28i+16i^2$

$\boxed{33+56i}$

19) i^{15}

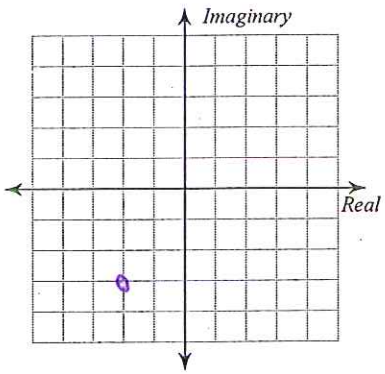
$-i$

20) i^{99}

$-i$

Graph each number in the complex plane.

21) $-2-3i$



22) $2-2i$