Name: Key Period: _____

College Prep Semester Final Review

Solve.

1. $|x+24| = -7x$

$x+24 = -7x$

$x = -3$

$x+24 = 7x$

$x \neq 4$

2. $|4x+5| > 13$

$x > 2$ or $x < -4.5$

3. $|4y-9| \leq 7$

$4y-9 \leq 7$ $\quad$ $4y-9 \geq -7$

$y \leq 4$ and $y \geq \frac{1}{2}$

Solve the system using any algebraic method.

4. $\begin{cases} 2x+5y=7 \\ x+4y=2 \end{cases}$

(6, 1)

5. $\begin{cases} 8x-4y=-32 \\ -3x+4y=2 \end{cases}$

$5x = -30$

$x = -6$

$y = -4$

$(-6, -4)$

Factor.

6. $x^2-3x-18$

$(x-6)(x+3)$

7. $11z^2+2z-9$

$(11z-9)(z+1)$

8. x^2-16

$(x-4)(x+4)$

9. $25x^2-9$

$(5x-3)(5x+3)$

Solve by factoring.

10. $x^2 - 7x + 10 = 0$

$(x-5)(x-2) = 0$

$x = 5, 2$

11. $3p^2 + 10p - 8 = 0$

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

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

$p = 2/3, -4$

Simplify.

12. $\sqrt{-18}$

$3i\sqrt{2}$

13. $2\sqrt{3} \cdot 4\sqrt{4}$

$16\sqrt{3}$

Solve.

14. $4p^2 = 448$

$p^2 = 112$

$p = \pm 4\sqrt{7}$

15. $y^2 - 22 = -112$

$y^2 = -90$

$y = \pm 3i\sqrt{10}$

Perform the indicated operation. Write your answer as a complex number in standard form.

16. $(8 + 20i) - (-8 + 12i)$

$16 + 8i$

17. $(4 + 5i) + (-3 + 2i)$

$1 + 7i$

Solve by completing the square.

18. $x^2 + 6x + 4 = 0$

$x^2 + 6x + \underline{9} = -4 + \underline{9}$

$(x+3)^2 = 5$

$x = -3 \pm \sqrt{5}$

19. $x^2 - 10x + 8 = 0$

$(x-5)^2 = 17$

$x = 5 \pm \sqrt{17}$

Write the quadratic function in vertex form, then identify the vertex.

20. $y = x^2 - 8x + 19$

$(x-4)^2 + 3$

$(4, 3)$

21. $y = x^2 + 12x + 37$

$(x+6)^2 + 1$

$(-6, 1)$

Solve using the quadratic formula.

22. $x^2 - 6x + 7 = 0$

$$x = \frac{6 \pm \sqrt{(6)^2 - 4(7)(1)}}{2}$$

$$= \frac{6 \pm \sqrt{8}}{2} = 3 \pm \sqrt{2}$$

23. $x^2 + 6x = -15$

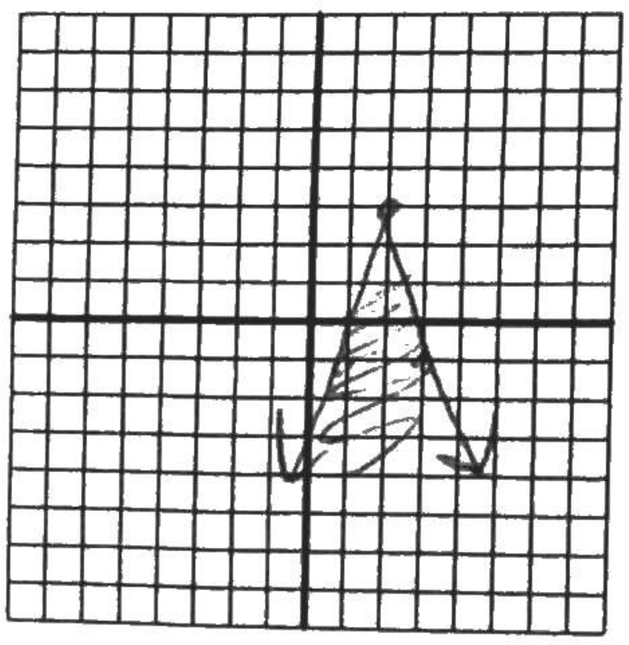
$x^2 + 6x + 15 = 0$

$$x = \frac{-6 \pm \sqrt{6^2 - 4 \cdot 15 \cdot 1}}{2}$$

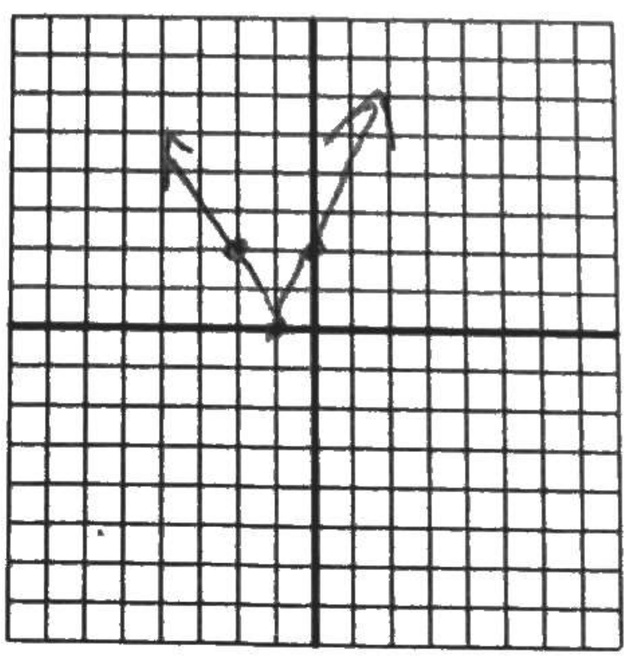
$$x = \frac{-6 \pm \sqrt{-24}}{2} = -3 \pm i\sqrt{6}$$

Graph.

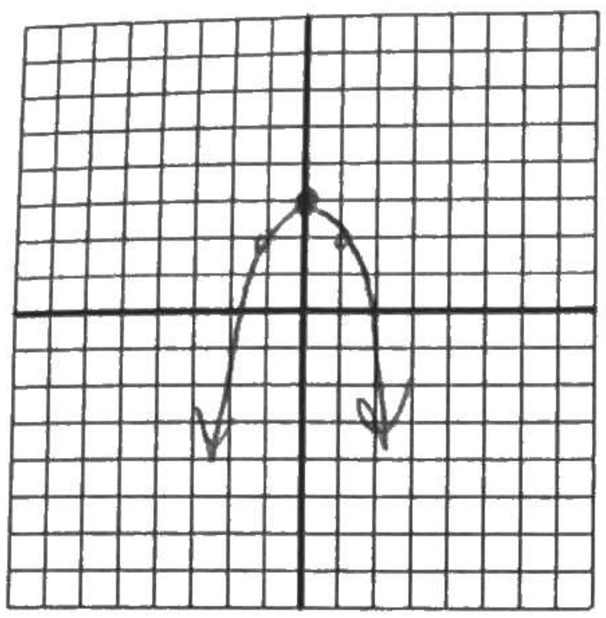
24. $f(x) < -4|x - 2| + 3$



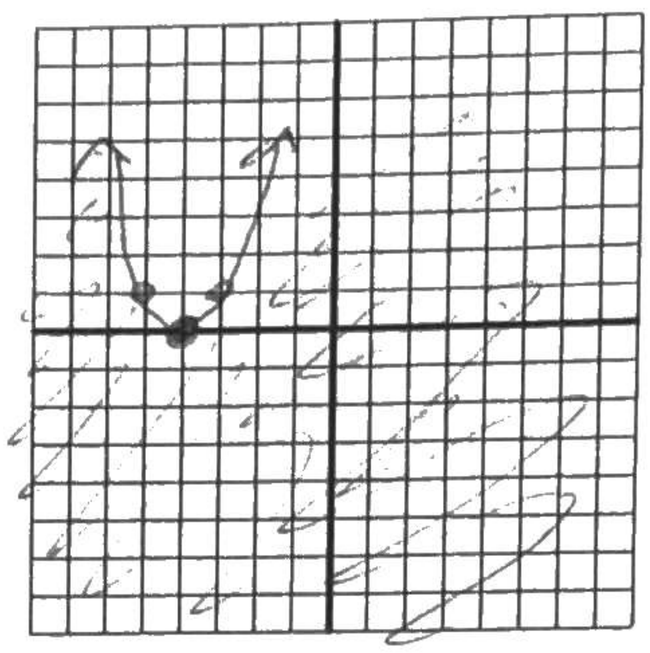
25. $y = 2|x + 1|$



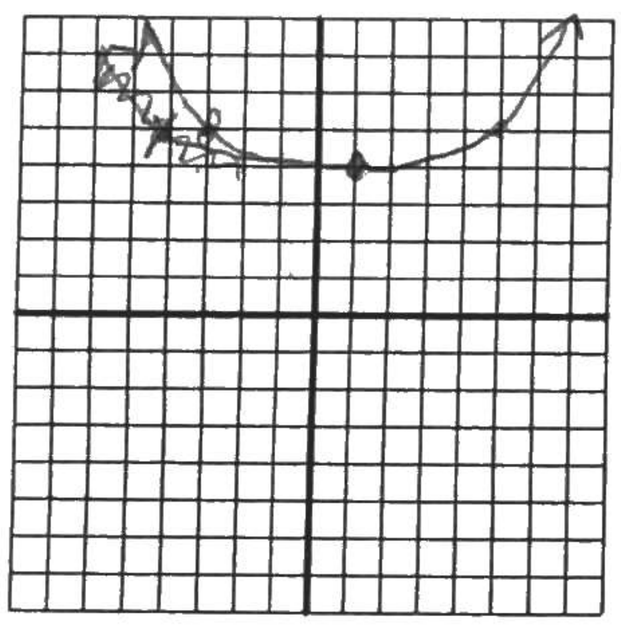
26. $y = -x^2 + 3$



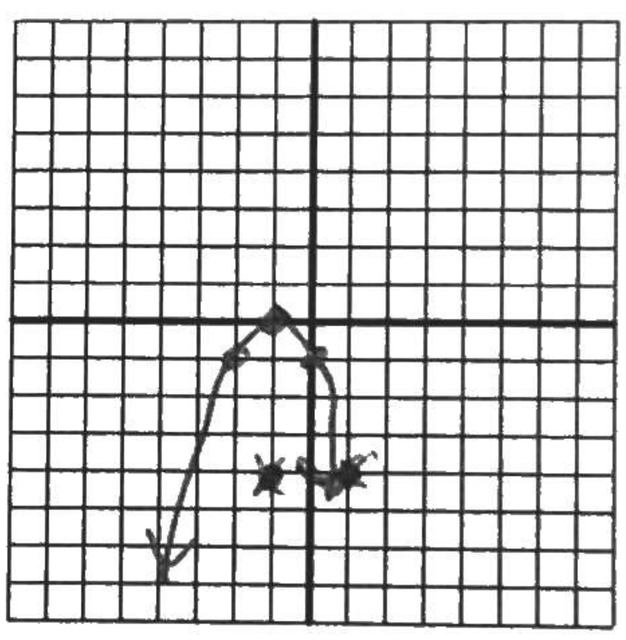
27. $y \leq (x+4)^2$



28. $f(x) = \frac{1}{4}(x-1)^2 + 4$



29. $f(x) = -x^2 - 2x - 1$



$x = \frac{-b}{2a}$

Vertex

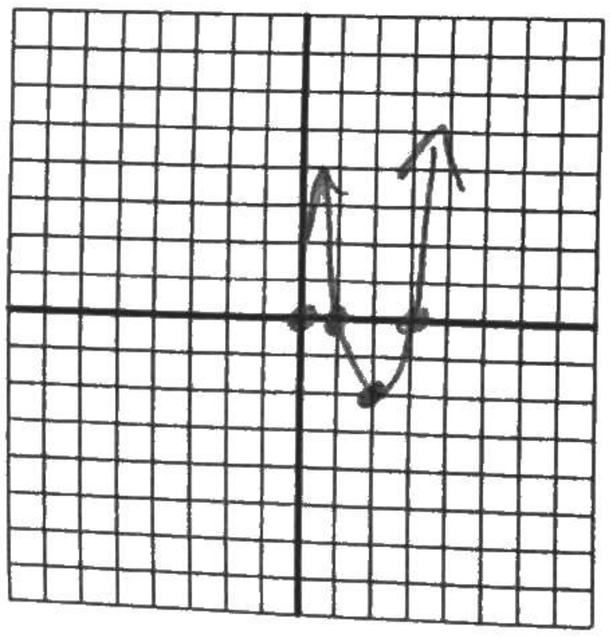
$x = -1$

$y = 0$

x	y
0	-1
-2	-1

30. $f(x) > 2x^2 - 8x + 6$

Vertex: $(2, -2)$



31. $y = 2x^2$