Review Sheet for Exam #1

Factor Completely

1) $14a^{12}b + 12a^8b^3$
2) $2x^2y^2 + 8x^5y^9$
3) $100x^4 - y^{24}$
4) $36x^{36} - 25y^{10}$
5) $8x^2 - 10x - 3$
6) $-4 + 15x^2 + 4x$

Find the roots of the function. Express your answer in simplest form when possible.

7) $y = x^2 - 16x + 89$
8) $y = x^2 - 2x - 8$

Find the roots and the y intercept, identify the vertex, and sketch the parabola.

9) $y = x^2 + 7x + 12$
10) $y = x^2 - 2x - 8$

Graph the equation.

11) $5y + 15 = -x$
12) $y - 2x = 10$

13) Write the equation of the line that goes through the point $(4, -2)$ and is perpendicular to $4x + 3y = -6$.

14) Write the equation of the line that passes through the points $(-2,3)$ and $(4,6)$.

Simplify and express your answer in $a + bi$ form.

15) $\frac{4+i}{2-5i}$
16) $\frac{5-3i}{-9-7i}$

Simplify.

17) i^{101}
18) i^{99}

Solve the system of equations.

19) $\begin{matrix} 2y = x - 6 \\ 4x + y = -3 \end{matrix}$
20) $\begin{matrix} 2x - 5y = 7 \\ 3x - 10 = 13 \end{matrix}$

21) $\begin{matrix} 4x + 4y + z = 24 \\ 2x - 4y + z = 0 \\ 5x - 4y - 5z = 12 \end{matrix}$

Put in Vertex Form

22) $y = 5x^2 + 90x - 30$
23) $y = 3x^2 + 48x - 63$

Put the equation of the circle into standard form, then identify the center and radius. Lastly, graph the circle on an xy axis, labeling the center and 4 points on the circle.

24) $x^2 + 14x + y^2 - 20y - 47 = 0$

Answer Key

1) $14a^8b(7a^4 + 6d^2)$

2) $2x^2y^2(1 + 4x^3y^7)$

3) $(10x^2 + y^{12})(10x^2 - y^{12})$

4) $(6x^{18} - 5y^5)(6x^{18} + 5y^5)$

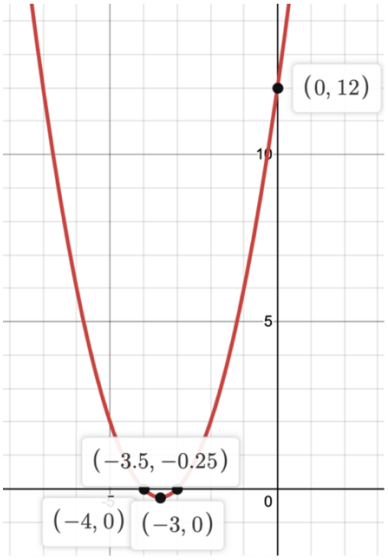
5) $(4x + 1)(2x - 3)$

6) $(3x + 2)(5x - 2)$

7) $8 \pm 5i$

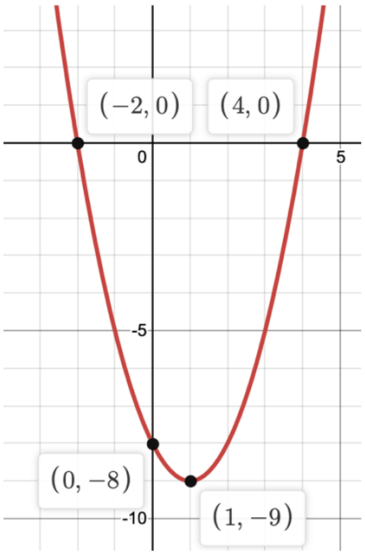
8) $\frac{5 \pm \sqrt{97}}{4}$

9)



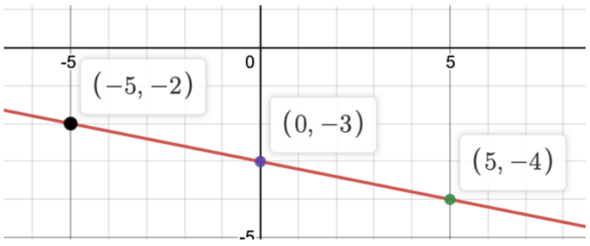
x-intercepts: $(-3,0), (-4,0)$
y-intercept: $(0,12)$
vertex: $\left(-\frac{7}{2}, -\frac{1}{4}\right)$

10)

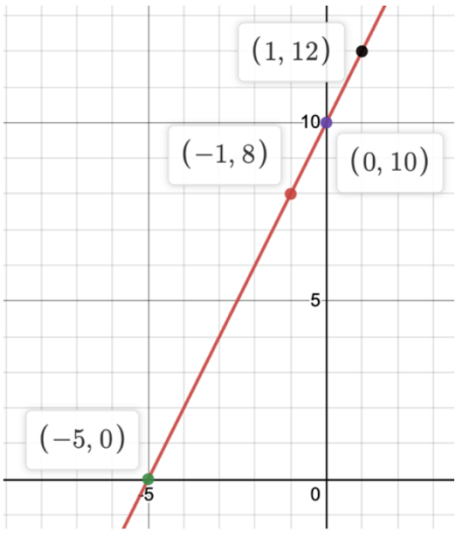


x-intercepts: $(-2,0), (4,0)$
y-intercept: $(0,8)$
vertex: $(1, -9)$

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



12) $y = 2x + 10$



13) $y = \frac{3}{4}x - 5$

14) $y = \frac{1}{2}x + 4$

15) $\frac{3}{29} - \frac{22}{29}i$

16) $-\frac{12}{65} - \frac{31}{65}i$

17) i

18) $-i$

19) $(0,-3)$

20) $\left(\frac{23}{3},\frac{5}{3}\right)$

21) $(4,2,0)$

22) $y=5(x+9)^2-435$

23) $y=3(x+8)^2-255$

24)$(x+7)^2+(y-10)^2=196$