

HONORS ALGEBRA 2
Chapters 7 and 8
Test A – Spring, 2009

Name _____
 Date _____
 Period _____

The solutions are in blue for each problem on the test. Calculators were allowed.

Solve each equation for *all* solutions.

1. $t^{2/3} - 4t^{1/3} - 12 = 0$

$$\begin{aligned} (t^{1/3} - 6)(t^{1/3} + 2) &= 0 \\ t^{1/3} = 6 & \quad | \quad t^{1/3} = -2 \\ t = 216 & \quad | \quad t = -8 \\ t = -8, 216 & \end{aligned}$$

2. $y^4 - 4y^2 - 32 = 0$

$$\begin{aligned} (y^2 - 8)(y^2 + 4) & \\ y^2 = 8 & \quad | \quad y^2 = -4 \\ y = \pm 2\sqrt{2} & \quad | \quad y = \pm 2i \\ y = \pm\sqrt{2}, \pm 2i & \end{aligned}$$

3. $x^3 + 2x^2 - 9x - 4 = 0$

$$\begin{array}{r|rrrr} -4 & 1 & 2 & -9 & -4 \\ & & -4 & 8 & 4 \\ \hline & 1 & -2 & -1 & \overline{0} \end{array}$$

$$\begin{aligned} x &= \frac{2 \pm \sqrt{(-2)^2 - 4(1)(-1)}}{2(1)} \\ &= \frac{2 \pm \sqrt{8}}{2} \\ &= \frac{2 \pm 2\sqrt{2}}{2} \\ &= 1 \pm \sqrt{2} \end{aligned}$$

$x = -4, 1 \pm \sqrt{2}$

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

$$\begin{array}{r|rrrrr} 1 & 1 & 2 & -3 & -4 & 4 \\ & & 1 & 3 & 0 & -4 \\ \hline & 1 & 3 & 0 & -4 & \overline{0} \end{array}$$

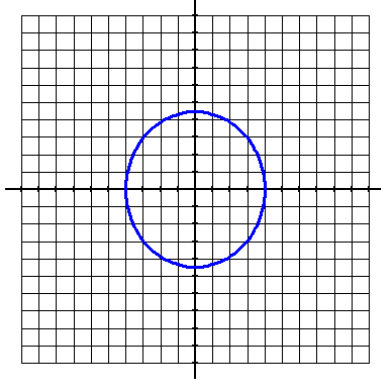
$$\begin{array}{r|rrrr} 1 & 1 & 3 & 0 & -4 \\ & & 1 & 4 & 4 \\ \hline & 1 & 4 & 4 & \overline{0} \end{array}$$

$$\begin{aligned} (x+2)(x+2) &= 0 \\ x &= -2 \end{aligned}$$

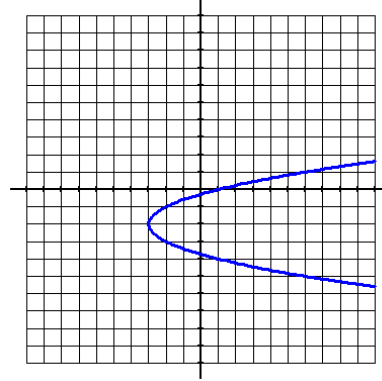
$x = -2, 1$

Sketch the following conic sections in the window provided.

5. $\frac{x^2}{16} + \frac{y^2}{20} = 1$



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



Answer the following.

7. State the exact x -intercepts (as coordinates) in the graph of $y = 2x^3 - 3x^2 - 14x + 21$.

Factor by grouping: $y = x^2(2x - 3) - 7(2x - 3) = (2x - 3)(x^2 - 7)$

Intercepts are $(3/2, 0)$, $(-\sqrt{7}, 0)$, $(\sqrt{7}, 0)$

8. A circle with center $(-4, 3)$ has a radius of 7. Write the equation of this circle in general (expanded polynomial) form.

$$\begin{aligned} (x + 4)^2 + (y - 3)^2 &= 49 \\ x^2 + 8x + 16 + y^2 - 6y + 9 &= 49 \\ x^2 + y^2 + 8x - 6y - 24 &= 0 \end{aligned}$$

9. A conic section is defined by the equation $2x^2 - y^2 + 8x - 2y - 17 = 0$. Write this conic section's equation in standard form.

$$\begin{aligned} 2(x^2 + 4x + 4) - (y^2 + 2y + 1) &= 17 + 8 - 1 \\ 2(x + 2)^2 - (y + 1)^2 &= 24 \\ \frac{(x + 2)^2}{12} - \frac{(y + 1)^2}{24} &= 1 \end{aligned}$$

10. Match the equation with its type of conic section.

- | | | | | |
|------|------------------------------|---|----|-----------|
| i. | $3y^2 + x + y - 4 = 0$ | → | a. | circle |
| ii. | $2x^2 + 2y^2 - x - 12 = 0$ | → | b. | ellipse |
| iii. | $y^2 + 3x^2 + 5y - 40 = 0$ | → | c. | hyperbola |
| iv. | $x^2 - y^2 + 2x - y + 2 = 0$ | → | d. | parabola |

Bonus:

Find the standard form of the equation that represents the graph shown at the right.

$$\frac{(x+1)^2}{9} - \frac{(y-2)^2}{16} = 1$$

