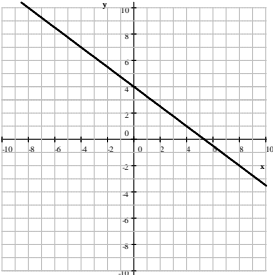
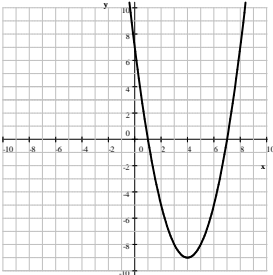
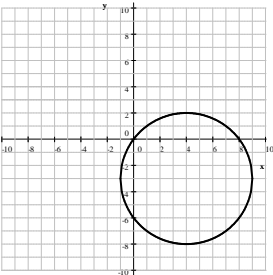
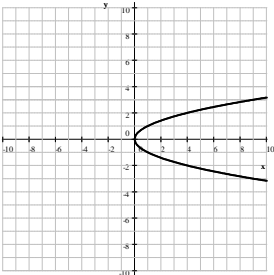


Review Problems

Please note that Quiz 4 will also cover topics covered on Quizzes 1-3. Please review those topics as well, even if they do not appear on this document.

- Simplify each of the following expressions.
 - $2\sqrt{80} - 5\sqrt{45} + \sqrt{500}$
 - $(3\sqrt{5} - 1)^2$
 - $(3\sqrt{5} - 1)^3$
 - $\frac{11}{3\sqrt{5} - 1}$
 - Find the exact value of $a^2 - 2a + 8$ if $a = 3\sqrt{5} - 1$.
- Factor completely by completing the square or state if the expression does not factor.
 - $12x - 2x^2 - 16$
 - $12x - 2x^2 - 20$
 - $12x - 2x^2 - 4$
 - $12x - 2x^2 - 32$
 - $6x^2 - x - 15$
- Solve each of the following inequalities.
 - $x^2 + 4 < 6x$
 - $6 - x^2 - x \leq 0$
 - $x^2 - 6x \leq -11$
- Graph each of the following equations.
 - $y = -\frac{3}{4}x + 4$
 - $y = x^2 - 8x + 7$
 - $6y + x^2 + y^2 = 8x$
 - $x = y^2$
- Find an equation for each of the following lines given.
 - has slope $-\frac{2}{3}$ and passes through the point $(-6, 5)$.
 - passes through the points $(-2, -7)$ and $(3, 3)$
- Write the equation for the circle centered at $(7, 0)$ and radius 6 units.
- Find the coordinates of the point(s) where the following graphs intersect each other. (Use algebraic methods, and not just graphing.)
 - $2x - 3y = 12$ and $3x - 4y = 18$
 - $y = x^2 + 4x - 18$ and $y = 2x - 3$
 - $(x - 1)^2 + (y + 2)^2 = 25$ and $y = x - 2$
- Solve each of the following percent problems.
 - Sally got a 5% raise. Now she is making \$2520. How much was she making before the raise?
 - A couch went on a 15% discount. The discount price is \$765. What was the original price?
- Chicago, IL and Paris, TX are about 875 miles apart. A car leaves Chicago to Paris at the same time as a train leaves Paris for Chicago. The train is $41\frac{\text{mi}}{\text{h}}$ (miles per hour) faster than the car. Find the speed of the train if it takes 5 hours until the train and car meet.
- Find the distance between $(3, 5)$ and $(8, -3)$.
- We invested \$5000 in two accounts. One account earns a 7% interest rate, the other earns 13%. How much money was invested in each account if after one year, the combined interest from the two accounts was \$542?

Answers

1. See handout Radical Expressions.
 - a) $3\sqrt{5}$
 - b) $46 - 6\sqrt{5}$
 - c) $144\sqrt{5} - 136$
 - d) $\frac{3\sqrt{5} + 1}{4}$
 - e) $56 - 12\sqrt{5}$
2. See handouts Completing the Square parts 1, 2, 3, and 4.
 - a) $-2(x - 2)(x - 4)$
 - b) does not factor
 - c) $-2(x - 3 + \sqrt{7})(x - 3 - \sqrt{7})$
 - d) does not factor
 - e) $6\left(x - \frac{5}{3}\right)\left(x + \frac{3}{2}\right)$ or $(3x - 5)(2x + 3)$
3. See handout Quadratic Inequalities.
 - a) $3 - \sqrt{5} < x < 3 + \sqrt{5}$
 - b) $x \leq -3$ or $x \geq 2$
 - c) no solution
4.
 - a) 
 - b) 
 - c) 
 - d) 
 - b) See handout Graphing Parabolas.
 Vertex: $(4, -9)$, y -intercept: $(0, 7)$, x -intercepts: $(1, 0)$ and $(7, 0)$
 Additional points: $(2, -5)$, $(3, -8)$, $(5, -8)$, $(6, -5)$
 - c) $(x - 4)^2 + (y + 3)^2 = 25$
5. See 1.10 or handout Writing Equations of Lines.
 - a) $-\frac{2}{3}(x + 6) = y - 5$ or $y = -\frac{2}{3}x + 1$
 - b) $y = 2x - 3$
6. See 1.8. $(x - 7)^2 + y^2 = 36$
7. See 1.8, 9.1, 9.2, and handout Circles.
 - a) $(6, 0)$
 - b) $(-5, -13)$ and $(3, 3)$
 - c) $(-3, -5)$ and $(4, 2)$
8. See handout Basic Percent Problems
 - a) \$2400
 - b) \$900
9. See handout Linear Word Problems $108\frac{\text{mi}}{\text{h}}$
10. See handout the Pythagorean Theorem. $\sqrt{89}$ units
11. See handouts linear word problems and systems of equations by substitution or elimination.
 \$1800 at 7% and \$3200 at 13%