

Review Problems

Please note that Quiz 4 will also cover topics covered on Quizzes 1-3 and Exam1. 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 $y = x - 2$
 - $x^2 + y^2 = 10$ and $(x - 1)^2 + (y - 2)^2 = 5$
- 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?
- Suppose that a and b are real numbers where one number is fifteen less than twice another.
 - Find the smallest value of $a^2 + b^2$
 - Find the smallest value of ab .
- 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?
- Suppose that (a_n) is an arithmetic sequence with first element $= -27$ and $d = 4$. Compute each of the following.
 - a_{50}
 - a_{500}
 - s_{50}
 - s_{500}

Answers

- See handout Radical Expressions.
 - $3\sqrt{5}$
 - $46 - 6\sqrt{5}$
 - $144\sqrt{5} - 136$
 - $\frac{3\sqrt{5} + 1}{4}$
 - $56 - 12\sqrt{5}$
- See handouts Completing the Square parts 1, 2, 3, and 4.
 - $-2(x - 2)(x - 4)$
 - does not factor
 - $-2(x - 3 + \sqrt{7})(x - 3 - \sqrt{7})$
 - does not factor
 - $6\left(x - \frac{5}{3}\right)\left(x + \frac{3}{2}\right)$ or $(3x - 5)(2x + 3)$
- See handout Quadratic Inequalities.
 - $3 - \sqrt{5} < x < 3 + \sqrt{5}$
 - $x \leq -3$ or $x \geq 2$
 - no solution
- -
 -
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 - See handout Graphing Parabolas.
 Vertex: $(4, -9)$, y -intercept: $(0, 7)$, x -intercepts: $(1, 0)$ and $(7, 0)$
 Additional points: $(2, -5)$, $(3, -8)$, $(5, -8)$, $(6, -5)$
 - $(x - 4)^2 + (y + 3)^2 = 25$
- See 1.10 or handout Writing Equations of Lines.
 - $-\frac{2}{3}(x + 6) = y - 5$ or $y = -\frac{2}{3}x + 1$
 - $y = 2x - 3$
- See handout Circles 1 or 1.8. $(x - 7)^2 + y^2 = 36$
- See handout non-linear systems and Circles or 1.8, 10.1, 10.8.
 - $(6, 0)$
 - $(-5, -13)$ and $(3, 3)$
 - $(-3, -5)$ and $(4, 2)$
 - $(-1, 3)$ and $(3, 1)$
- See handout Basic Percent Problems
 - \$2400
 - \$900
- See handout Optimization 1.
 - 45
 - $-\frac{225}{8}$
- See handout the Pythagorean Theorem. $\sqrt{89}$ units
- See handouts linear word problems and systems of equations by substitution or elimination. \$1800 at 7% and \$3200 at 13%
- See handout Arithmetic Sequences or 12.2.
 - 169
 - 1969
 - 3550
 - 485 500