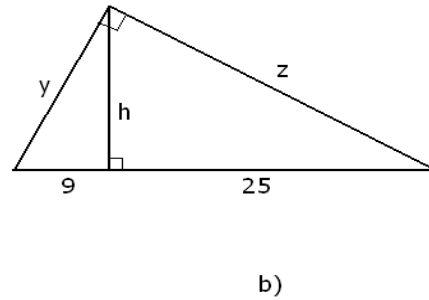
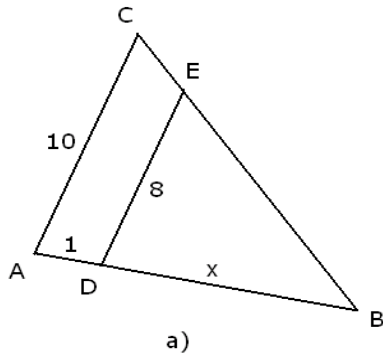


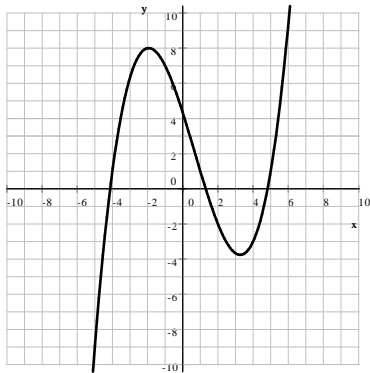
Please note that Quiz 5 will also cover topics covered on Quizzes 1-4. Please review those topics as well, even if they do not appear on this document.

- Simplify each of the following expressions.
 - $\left(\frac{2}{3^{-1}}\right)^{-2}$
 - $(2 - 3^{-1})^{-2}$
 - $\left(\frac{-a^{-2}b}{b^{-2}}\right)^{-3} (-a)^{-2}$
 - $\left(\frac{-2x^{-2}y^3}{(-3)^3 x^{-5}y^7}\right)^0$
- 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 $-a^2 - 5a + 8$ if $a = 3\sqrt{5} - 1$
- Factor completely by completing the square or state if the expression does not factor.
 - $12x - 2x^2 - 16$
 - $12x - 2x^2 - 20$
 - $12x - 2x^2 - 4$
 - $12x - 2x^2 - 32$
 - $6x^2 - x - 15$
- Write the equation for the circle centered at $(7, 0)$ and radius 6 units.
 - Find the center and radius of the circle $10y + x^2 + y^2 = 6(x + 11)$
- Consider the circle $2x + x^2 + y^2 = 6y + 10$.
 - State the center and radius of the circle.
 - We drew a tangent line to the circle at the point $(3, 5)$. Find an equation for this tangent line.
- 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 $(3, 3)$
- A person is standing 35 feet away from a street light that is 28 ft tall. How long is his shadow if he is 5.6 feet tall?
- 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
 - $a^2 + b^2$
 - ab
- If we price the tickets at \$30, then we will sell 500 tickets. For every dollar raise in the price, 5 less tickets will be sold. What is the greatest revenue we can obtain from the sale of tickets and what price will guarantee such a maximal revenue?
- 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?

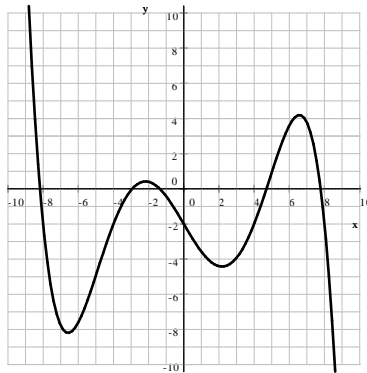
14. Consider the right triangle ABC . The height drawn to its hypotenuse AB divides it to line segments AD and DB . How long are the sides of the triangle if $\overline{AD} = 3$ and $\overline{DB} = 1$?
15. Compute the area of a regular triangle if all of its sides are 5 meters long.
16. Consider the picture below.
- Line segments AC and DE are parallel. Find the exact value of x .
 - Find the exact values of y , z , and h .



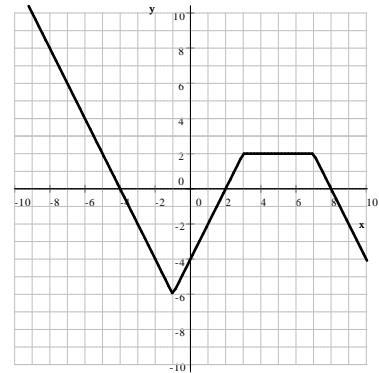
17. Based on the graphs given, find the x -coordinates of all points $P(x, y)$ on the graphs satisfying the equation or inequality given.



a) $y < 1$



b) $y \leq -2$



c) $y \geq 2$

Answers

1. See Exponents a) $\frac{1}{36}$ b) $\frac{9}{25}$ c) $-\frac{a^4}{b^9}$ d) 1

2. See handout Radical Expressions.

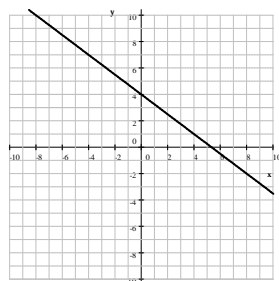
a) $3\sqrt{5}$ b) $46 - 6\sqrt{5}$ c) $144\sqrt{5} - 136$ d) $\frac{3\sqrt{5} + 1}{4}$ e) $-33 - 9\sqrt{5}$

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

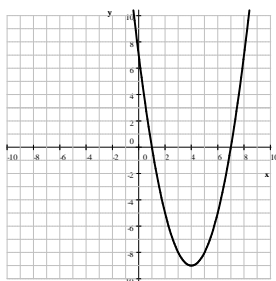
4. See handout Circles 1. a) $(x-7)^2 + y^2 = 36$ b) center: $C(3, -5)$ radius $r = 10$

5. See handout Circles 1. a) $C(-1, 3)$ $r = \sqrt{20}$ b) $-2(x-3) = y-5$ or $y = -2x + 11$

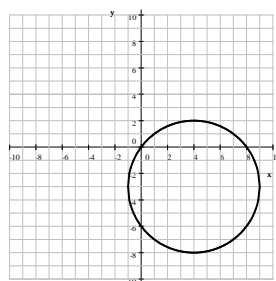
6. a)



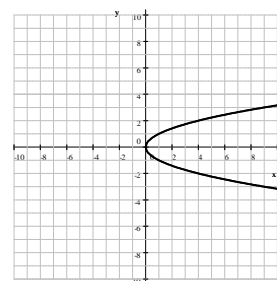
b)



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) $(x-4)^2 + (y+3)^2 = 25$

7. See handout Writing Equations of Lines.

a) $-\frac{2}{3}(x+6) = y-5$ or $y = -\frac{2}{3}x + 1$ b) $y = 2x - 3$

8. See handout Similar Triangles 8.75 feet

9. See handout Basic Percent Problems a) \$2400 b) \$900

10. See handout Optimization 1. a) 45 b) $-\frac{225}{8}$

11. See handout Optimization 1. A price of \$65 means a revenue of \$21 125

12. See handout the Pythagorean Theorem. $\sqrt{89}$ units

13. See handouts linear word problems and systems of equations by substitution or elimination. \$1800 at 7% and \$3200 at 13%

14. See handout Similar Triangles 2 units, $2\sqrt{3}$ units, and 4 units long.

15. See handout Pythagorean Theorem. $\frac{25}{4}\sqrt{3}$ m²

16. See handout Similar Triangles. a) 4 b) $y = \sqrt{306} = 3\sqrt{34}$, $z = \sqrt{850} = 5\sqrt{34}$, $h = 15$

17. See handout Graphical Solutions.

a) $(-\infty, -4) \cup (1, 5)$ b) $[-8, -4] \cup [0, 4] \cup [8, \infty)$ c) $(-\infty, -5] \cup [3, 7]$