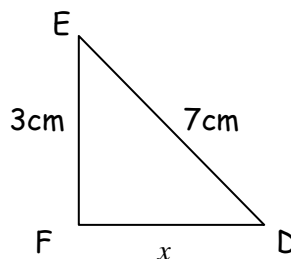
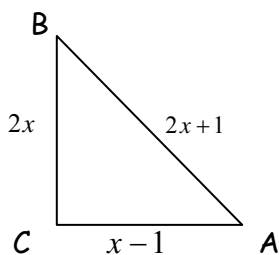


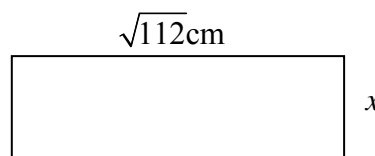
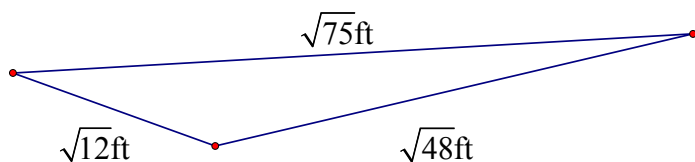
Exam 4 Review

Math 1175, Fundamentals of Mathematics, Fall 2011, Mathematics and The Brooklyn Bridge

- Explain why dividing both sides of $x^2 = 4x$ by x is an illegal operation. Hint: when solving equations, doing something which may eliminate a legitimate solution is not allowed.
- In contrast to eliminating a legitimate solution, doing something that introduces an extraneous or false solution is allowed. Give an example of such a process and explain how, in spite of the introduction of false solutions, you can finish with the correct solution set.
- You have now learned 3 methods for solving quadratic equations. What are they? Select your 2 favorite methods. Compare the advantages and disadvantages of the 2 you have selected. For each of your 2 selected methods, give an example of an equation best solved by that method.
- Simplify a) $\sqrt{49x^{10}}$ b) $2p\sqrt{63p^5}$ c) $-3pq^2\sqrt{125k^7q^8}$
- Simplify and multiply:
 - $(2\sqrt{3} - \sqrt{5})^2$
 - $3\sqrt{3}(\sqrt{2x} - 4x\sqrt{15})$
 - $(3\sqrt{2} + 2\sqrt{3})(2\sqrt{50} - 3\sqrt{12})$
- Simplify and rationalize the denominator:
 - $\frac{\sqrt{24x^5}}{\sqrt{3x^2y}}$
 - $\frac{\sqrt{4x}}{2\sqrt{3}}$
 - $\frac{\sqrt{24}}{3-\sqrt{3}}$
 - $\frac{2\sqrt{3}-3\sqrt{2}}{\sqrt{3}+\sqrt{8}}$
 - $\frac{x\sqrt{2}}{x\sqrt{2}+3\sqrt{5}}$
- Solve for x and check for extraneous solutions:
 - $x - \sqrt{x-2} = 4$
 - $x = 4 + 3\sqrt{x-4}$
 - $\sqrt{5-x} - x = 1$
- Use the square root property to solve for y :
 - $y^2 = 135$
 - $(y+4)^2 = 169$
- Solve for x using the quadratic formula. Express the answers in simplest radical form.
 - $x^2 + 10x + 7 = 0$
 - $3x^2 + 3 = 8x$
 - $x^2 - 6x = 4$
 - $(x+2)(x+4) = 2$
- In $\triangle ABC$, $\angle C = 90^\circ$, $AC = x-1$, $BC = 2x$, $AB = 2x+1$. Find:
 - x
 - all three sides of $\triangle ABC$
 - area of $\triangle ABC$
- In $\triangle DEF$, $\angle F = 90^\circ$, $EF = 3\text{cm}$, $DE = 7\text{cm}$. Find (exact and approximate to one decimal place):
 - x
 - perimeter of $\triangle DEF$
 - area of $\triangle DEF$



12. Find exact and approximate perimeter of triangle to one decimal place



- The rectangle has perimeter $12\sqrt{7}$ cm.
 - Find the exact value of x .
 - Find the area and perimeter of the rectangle.
- One of the main cables of a model bridge has an equation $x^2 = 16h$ where x is the horizontal distance from its lowest point and h is the height above its lowest point. The span between the towers is 16 inches.
 - Draw a sketch and determine the vertical height of the cable. (Hint: let $x = 8$, solve for h .)
 - Determine exact and approx. location(s) where h is 2 inches. Use the square root principle in the solution.