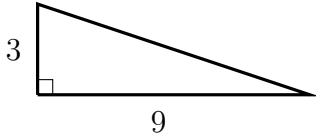# Homework assignment for Spring Break 2018, MTH 06.
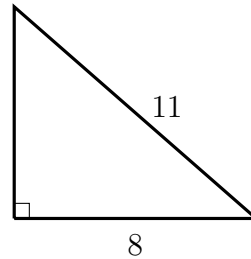
Completed assignments will receive 10 extra points in test 2.

1. Find the missing length. Express the answer in radical form if necessary.

   (a)

   (b)

2. Simplify the expressions

   (a) $\sqrt{12}$

   (b) $\sqrt[3]{250}$

   (c) $\sqrt[3]{24x^5y^6z^7}$

   (d) $\sqrt[3]{\dfrac{54x^5}{8y^6}}$

   (e) $\dfrac{6}{\sqrt{7}}$

   (f) $\dfrac{5}{\sqrt{27x^3}}$

   (g) $\dfrac{2x}{\sqrt[3]{7x^2}}$

   (h) $\sqrt[3]{\dfrac{5}{16y^4}}$

3. Add or subtract, as indicated, and simplify.

   (a) $\sqrt{20} + \sqrt{5}$

   (b) $2\sqrt{12x^2} - 7\sqrt{x}$

   (c) $\dfrac{\sqrt{12}}{2} + \dfrac{1}{\sqrt{6}}$

   (d) $\sqrt{10} - \dfrac{3}{\sqrt{10}}$

4. Multiply and simplify.

   (a) $\sqrt{20} \cdot \sqrt{5}$

   (b) $\sqrt{2}(\sqrt{3} + 3)$

   (c) $(\sqrt{5} + \sqrt{6})(\sqrt{5} - \sqrt{3})$

   (d) $(\sqrt{3} + \sqrt{5})^2$

5. Rationalize and simplify.

   (a) $\dfrac{4\sqrt{20}}{3 - \sqrt{5}}$

   (b) $\dfrac{\sqrt{3} - 2}{\sqrt{3} - \sqrt{2}}$

6. Solve the equations

   (a) $\sqrt{2x-5}-6=0$

   (b) $\sqrt{2y+7}+4=y$

   (c) $\sqrt{y^2+12y}-3\sqrt{5}=0$

   (d) $\sqrt{x+1}+\sqrt{x}=1$

7. Simplify.

   (a) $\left(\dfrac{x^{1/2}y^{-1/3}}{x^{2/3}y}\right)^{1/3}$

   (b) $\left(\dfrac{5x^{3/4}y^{-6/5}}{x^{-2/3}y^2}\right)^{-1/3}$

8. Calculate and write in the form $a+ib$.

   (a) $(3+5i)(2-3i)$

   (b) $(3-5i)(-2+7i)$

   (c) $\dfrac{3-5i}{-2+3i}$

   (d) i^{12}

   (e) i^{-9}

9. Add or subtract the rational expressions, as indicated, and simplify.

   (a) $\dfrac{x-1}{x+3}+\dfrac{x}{x-2}$

   (b) $\dfrac{x}{x^2+3x-10}-\dfrac{x-7}{x^2-4}$

   (c) $\dfrac{1}{x(x+3)^2(x-2)}+\dfrac{2}{x^2(x+3)(x-2)^2}$

   (d) $\dfrac{x+6}{x^2+6x+9}-\dfrac{x-4}{(x+3)(x-2)}$

10. Multiply or divide the rational expressions, as indicated, and simplify.

   (a) $\dfrac{x-1}{x+3}\cdot\dfrac{x}{x-1}$

   (b) $\dfrac{x}{x^2+3x-10}\div\dfrac{x^3}{x^2-4}$

   (c) $\dfrac{1}{x(x+3)^2(x-2)}\div\dfrac{2}{x^2(x+3)(x-2)^2}$

   (d) $\dfrac{x+6}{x^2+6x+9}\cdot\dfrac{x+3}{(x+6)(x-2)}$