The list of problems given below should provide a good review for the material in Appendix B. First try all of them without using a calculator. Then check your answers using a calculator

Please return the **detailed** solutions for the problems marked by $*$ symbol on Monday for grading.

Do all the problems, you will get a few of them on quizzes in the future.

1. Simplify the following expressions as much as possible.
   (a) $3-(5-(2-(9-4)))$ $*$
   (b) $(x+y)(2x+3y)$
   (c) $(x^2+x)(y+x)$
   (d) $(a-b)(a+b)$
   (e) $(a-b)(a^2+ab+b^2)$
   (f) $(\sqrt{x}+\sqrt{y})(x-\sqrt{xy}+y)$ $*$
   (g) a^3a^4
   (h) $x^2x^4x^5$
   (i) $(z+2)^3(z+2)^2$
   (j) $(2^3)^2-(3^2)^3$
   (k) $\dfrac{4^3}{4^2}$
   (l) $\dfrac{2^5 3^4}{3^6 2^2}$
   (m) $\left(\dfrac{x^5y^4}{x^6y^2z^2}\right)^2$
   (n) $\dfrac{2^4 3^4}{9^2 4^2}$
   (o) $\sqrt[3]{\dfrac{8a^6b^3}{27b^9}}$
   (p) $\sqrt[4]{\dfrac{a^4b^3}{16b^7}}\sqrt[3]{\dfrac{8a^9b^3}{27a^6}}$ $*$
   (q) $\sqrt{4}-\sqrt[3]{8}$

2. Evaluate the following mathematical expressions at the given values of the variable.
   (a) $f(x)=5x^3+2x^2+x+2$; at $x=-2$ and $x=2y$
   (b) $g(x)=x^6-2x^4-x^2+2$; at $x=1$ and $x=\sqrt{x}$
   (c) $h(x)=\dfrac{u+5}{(u^2+5u+8)}$; at $u=2$ and $u=u-5$
   (d) $r(x)=\dfrac{3x+6y+2}{7x-6y+1}$; at $x=2$ and $y=-1$ $*$

3. Read Examples 5, 6, 7, 8 and 9 on page A-18, A-19 and A-20 (at the end of the book in Appendix B) and do the following problems.
   (a) Rationalize the denominator of $\dfrac{9}{\sqrt{3}}$
   (b) Rationalize the denominator of $\dfrac{\sqrt{x}}{5+\sqrt{x}}$
   (c) Rationalize the denominator of $\dfrac{x}{\sqrt{x}-2}$
   (d) Rationalize the numerator of $\dfrac{\sqrt{x+h}-\sqrt{x}}{h}$ $*$

Please provide detailed solutions (write each and every step of the calculation) for the problems marked by $*$ symbol on Monday for grading.