Estimate the square and square root of a number

1. Estimate the value of	

a) 32^2
 	
  32 is between 30 and 40
  32^2 is between 30^2 and 40^2
That is, 32^2 is between 900 and 1600
Thus, $32^2 \approx 900$
	b) 11.9^2
	
	  11.9^2 is between 10 and 20
	  11.9^2 is between 10^2 and 20^2
	That is, 11.9^2 is between 100 and 400
	Thus, $11.9^2 \approx 100$

c) 8.7^2
 	
  8.7^2 is between 8and 9
  8.7^2 is between 8^2 and 9^2
  That is, 8.7^2 is between 64 and 81
Thus, $8.7^2 \approx 81$
	d) $(-6.2)^2$
	
	  $(-6.2)^2$ is between -6 and -7
	  $(-6.2)^2$ is between $(-6)^2$ and $(-7)^2$
	  That is, $(-6.2)^2$ is between 36 and 49
	  Thus, $(-6.2)^2 \approx 36$

2. Estimate the value of	

a) $\sqrt{52}$
 	
  52 is between perfect squares 49 and 64
  $\sqrt{52}$ is between $\sqrt{49}$ and $\sqrt{64}$
  That is, $\sqrt{52}$ is between 7 and 8
  Thus, $\sqrt{52} \approx 7$
	b) $\sqrt{21.7}$
	
	  $\sqrt{21.7}$ is between perfect squares 16 and 25
	  $\sqrt{21.07}$ is between $\sqrt{16}$ and $\sqrt{25}$
	  That is, $\sqrt{21.7}$ is between 4 and 5
	  Thus, $\sqrt{21.7} \approx 5$

c) $\sqrt{70}$
 	
  $\sqrt{70}$ is between $\sqrt{64}$ and $\sqrt{81}$
  That is, $\sqrt{70}$ is between 8 and 9
  Thus, $\sqrt{70} \approx 8$
	d) $\sqrt{111}$
	
	  $\sqrt{111}$ is between $\sqrt{100}$ and $\sqrt{121}$
	  That is, $\sqrt{111}$ is between 10 and 11
	  Thus, $\sqrt{111} \approx 10$