Without a calculator estimate the value of each square root as being between two consecutive integers.

1. $\sqrt{56}$ between 7 & 8
2. $\sqrt{113}$ between 10 & 11
3. $\sqrt{78}$ between 8 & 9
4. $\sqrt{11}$ between 3 & 4

4 49
9 64
16 81
25 100
36 121

Simplify each square root (this means no rounded decimals in your answer)

1. $\sqrt{48} = \sqrt{16 \cdot 3} = \sqrt{16} \cdot \sqrt{3} = 4\sqrt{3}$ (16 · 3)

2. $\sqrt{162} = \sqrt{81 \cdot 2} = \sqrt{81} \cdot \sqrt{2} = 9\sqrt{2}$

3. $\sqrt{117} = \sqrt{9 \cdot 13} = 3\sqrt{13}$

Simplify each.

4. $\sqrt{147}$ (49 · 3) $7\sqrt{3}$

5. $\sqrt{384}$ (64 · 6) $8\sqrt{6}$

6. $\sqrt{112}$ (16 · 7) $4\sqrt{7}$

7. $\sqrt{288}$ (144 · 2) $12\sqrt{2}$

Simplify each square root.

8. $\sqrt{153}$ (9 · 17) $3\sqrt{17}$

9. $\sqrt{486}$ (81 · 6) $9\sqrt{6}$

10. $\sqrt{208}$ (16 · 13) $4\sqrt{13}$

Section 10-3: Finding and Estimating Square Roots.

$(3)^2=$ 9 $(-3)^2=$ 9

What are the square roots of 9? ± 3

What are the square roots of 729? ± 27

What are the square roots of - 196?

- 196 has no real roots