Numerical Skills/Prealgebra

1. systolic pressure: $Age + 100$
   systolic pressure of 10 yr old: 10+100=110
   systolic pressure of 75 yr old: 75+100=175
   difference= 175-110=65

2. Increase in temperature $= 24 - (-8) = 32°F$

3.
$$\left(\frac{3}{4} - \frac{2}{3}\right) + \left(\frac{1}{2} + \frac{1}{3}\right)$$
$$= \left(\frac{9}{12} - \frac{8}{12}\right) + \left(\frac{3}{6} + \frac{2}{6}\right)$$
$$= \frac{1}{12} + \frac{5}{6} = \frac{1}{12} + \frac{10}{12} = \frac{11}{12}$$

4.
$$\frac{1}{2} + \left(\frac{2}{3} \div \frac{3}{4}\right) - \left(\frac{4}{5} \times \frac{5}{6}\right) = \frac{1}{2} + \left(\frac{2}{3} \times \frac{4}{3}\right) - \left(\frac{4}{5} \times \frac{5}{6}\right)$$
$$\frac{1}{2} + \frac{8}{9} - \frac{4}{6} = \frac{9}{18} + \frac{16}{18} - \frac{12}{18} = \frac{9 + 16 - 12}{18} = \frac{13}{18}$$

5. Convert mixed numbers to decimals, then add:
$$7\frac{3}{4} = 7.75$$
$$6\frac{1}{2} = 6.5$$
$$7.75 + 17.85 + 6.5 = 32.10$$

6.
$$\text{Cost per person for one 5 ticket block:}\quad = \frac{\$80.00}{5} = \$16.00$$

   Amount saved by each person $= \$18.50 - 16 = \$2.50$

7. Express the numbers in scientific notation

$$3,400,000 = 3.4 \times 10^6$$
$$20,000 = 2 \times 10^4$$

rewrite with the sixth exponent of 10, since the other number has 6th exponent of 10, it will be easy to add if both #'s have 10^6 as a factor.

$$= \frac{2}{10^2} \times 10^6 = \frac{2}{100} \times 10^6 = 0.02 \times 10^6$$
$$0.02 \times 10^6 + 3.4 \times 10^6 = 10^6(.02 + 3.4) = 3.42 \times 10^6$$

8. $4 < \sqrt{x} < 9$ implies $4 < \sqrt{x}$ and $\sqrt{x} < 9$
square each inequality to get $16 < x$ and $x < 81$
combine to get $16 < x < 81$

9. Cross multiply: $6x = 72 \quad x = 12$

10. If w cents is the cost for y apples, then using proportion, we can write

$$\frac{\text{x apples}}{\text{b cents}} = \frac{\text{y apples}}{\text{w cents}}, \quad \frac{x}{b} = \frac{y}{w}$$
cross multiply to get $xw = by$
$$w = \frac{by}{x}$$

11. $.25x = 12, \quad x = $ # of students in class

$$x = \frac{12}{0.25} = \frac{12}{(1/4)} = 48$$

12. students who took ≥ 8 courses=75% of graduating class

students who took 6 or 7 courses: 60% of 25% $= (.6)(.25) = .150 = 15\%$ of graduating class
Students who took < 6 courses $= 100\% - 75\% - 15\% = 10\%$

13. Let $\sum X = $ sum of Adam's 7 test scores:

$$\frac{\sum X}{6} = 84$$
$$\sum X = 6 \times 84 = 504$$
$$\text{Adams correct average score} \frac{\sum X}{7} = \frac{504}{7} = 72$$

14.
$$\text{Average score for all 50 students} = \frac{35 \times 80 + 15 \times 70}{35 + 15}$$
$$= \frac{2800 + 1050}{50} = \frac{3850}{50} = \frac{385}{5} = 77$$