

1. a. Simplify: $\frac{16}{48} \dots \frac{16}{48} = \frac{16}{3 \cdot 16} = \frac{1}{3}$

b. Evaluate: $\frac{1}{4} + \frac{3}{10} \dots \frac{1}{4} + \frac{3}{10} = \frac{1}{4} \cdot \frac{5}{5} + \frac{3}{10} \cdot \frac{2}{2} = \frac{5}{20} + \frac{6}{20} = \frac{5+6}{20} = \frac{11}{20}$

c. Write as a fraction: 20%... $20\% = \frac{20}{100} = \frac{1}{5}$

d. Write as a percent: $\frac{3}{4} \dots \frac{3}{4} = \frac{75}{100} = 75\%$

e. Simplify: $\frac{\frac{1}{2} + \frac{3}{8}}{\frac{5}{6} + \frac{1}{12}} \dots \frac{\frac{1}{2} + \frac{3}{8}}{\frac{5}{6} + \frac{1}{12}} = \frac{\frac{1}{2} + \frac{3}{8}}{\frac{5}{6} + \frac{1}{12}} \cdot \frac{24}{24} = \frac{\left(\frac{1}{2} + \frac{3}{8}\right) \cdot 24}{\left(\frac{5}{6} + \frac{1}{12}\right) \cdot 24} = \frac{12+9}{20+2} = \frac{21}{22}$ (24 is the least common

multiple of all 4 denominators in the compound fraction; fractions are used in probability)

2. Evaluate:

a. $5^2 \dots 5^2 = 5 \cdot 5 = 25$

b. $\sqrt{100} \dots \sqrt{100} = 10$ since $10^2 = 100$

c. $(1-0.99) \cdot \frac{100}{101} \dots (1-0.99) \cdot \frac{100}{101} = \left(\frac{100}{100} - \frac{99}{100}\right) \cdot \frac{100}{101} = \frac{1}{100} \cdot \frac{100}{101} = \frac{1}{101}$

d. $\sqrt{3^2 + 4^2} \dots \sqrt{3^2 + 4^2} = \sqrt{9+16} = \sqrt{25} = 5$ (make sure you add BEFORE taking the square root!)

e. $\sqrt{(0.6)^2 + (0.8)^2} \dots \sqrt{(0.6)^2 + (0.8)^2} = \sqrt{0.36+0.64} = \sqrt{1} = 1$ (used in 'standard deviation')

Math Review Handout

3. If $X_1 = 1$, $X_2 = 2$, and $X_3 = 3$ then

a. find $\frac{\sum_{i=1}^3 X_i}{3} \dots \frac{\sum_{i=1}^3 X_i}{3} = \frac{X_1 + X_2 + X_3}{3} = \frac{1+2+3}{3} = \frac{6}{3} = 2$ (this is the 'mean' of the three numbers)

b. find $\frac{\sum_{i=1}^3 (2 - X_i)^2}{2} \dots \frac{\sum_{i=1}^3 (2 - X_i)^2}{2} = \frac{(2 - X_1)^2 + (2 - X_2)^2 + (2 - X_3)^2}{2} = \frac{(1)^2 + (0)^2 + (-1)^2}{2} = \frac{2}{2} = 1$
 (this is the 'variance' of the three numbers)

Recall that $n! = n(n-1)(n-2)\dots 2 \cdot 1$. Evaluate:

c. $4! \dots 4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$

d. $\frac{7!}{2!2!3!} \dots \frac{7!}{2!2!3!} = \frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3!}{2!2!3!} = \frac{7 \cdot 6 \cdot 5 \cdot 4}{(2 \cdot 1)(2 \cdot 1)}$ (since the 3!'s canceled) $= \frac{7 \cdot 6 \cdot 5 \cdot 4}{4} = 7 \cdot 6 \cdot 5 = 210$

e. $\frac{1000!}{2!998!} \dots \frac{1000!}{2!998!} = \frac{1000 \cdot 999 \cdot 998!}{2!998!} = \frac{1000 \cdot 999}{2} = \frac{999000}{2} = 499,500$ (used in probability)

4. a. What is the slope of the line: $y = 4 - x$?... -1 (lines are used for 'regression')

b. What is the y-intercept of the line: $y = 4 - x$?... 4

c. Write the equation of a line with slope, 2, and y-intercept, 0... $y = 2x$

d. Graph: $y = x$

e. Graph: $y = 4 - x$

