## Arithmetic - Sheet \#4

## Do it in your head

1) $6.39 \div 1000$
2) $7.307 \cdot 100$
3) $9000^{2}$
4) $13 \cdot 4$
5) $25 \cdot 4$
6) $16 \cdot 3$
7) $15 \cdot 4$
8) $3^{4}$
9) $2^{6}$
10) $5^{3}$
11) $18000 \div 2000$
12) $(10.3)^{2}$
13) $350 \div 560$
14) $235,000 \cdot 4$
15) $8043-2987$
16) $8 \cdot 99999$
17) $15 \cdot 999$
18) $6200 \cdot 5$
19) $740 \div 5$
20) $45 \div 54$
21) $21-3.1$
22) $0.03 \div 0.0006$

## Divisibility.

23) State whether each number is evenly divisible by anything from 2 to 12 (but not 7).
a) 40,832
b) $1,062,882$
24) Give the prime factorization.
a) 270,000
b) $1,062,882$

Division. Leave your answers as mixed numbers. Use short division for single digit divisors.
25) $45277 \div 6$
26) $374000 \div 42$
27) $387031 \div 5823$

## Ratios, Part I - Sheet \#1

1) Find the ratio of milk to water.
a) 4 cups of milk and 6 cups of water.
b) 6 cups of milk and 4 cups of water.
c) 6 cups of water and 4 cups of milk.
d) 2 quarts of milk and 3 pints of water.
e) 2 quarts of water and 28 fl . oz. of milk.
f) $240 \mathrm{~m} \ell$ of milk and 180 ml of water.
2) What is the ratio of Jane's to Larry's to Kevin's money if they have $\$ 240, \$ 320$, and $\$ 440$, respectively?
3) For each problem, give the ratio of Bill to Mary.
a) What is the ratio of their weights if Bill weighs 160 pounds and Mary weighs 140 pounds?
b) What would the ratio of their weights be if they were weighed in kilograms?
c) What is the ratio of their heights if Bill is 5 '4" tall and Mary is $5^{\prime} 8^{\prime \prime}$ tall?
d) What would the ratio of their heights be if they were measured in meters?
e) What is the ratio of their salaries if Bill gets paid $\$ 10 / \mathrm{hr}$ and Mary gets paid \$300/week. (Both of them work 40 hours per week.)
4) Which of the following classes at Eastman Elementary School have equal ratios of boys to girls?

- First grade has 18 boys and 12 girls.
- Second grade has 10 boys and 8 girls.
- Third grade has 15 girls and 12 boys.
- Fourth grade has 12 girls and 15 boys.
- Fifth grade has 13 boys and 9 girls.
- Sixth grade has 15 boys and 10 girls.


## Percents - Sheet \#6

1) Find each answer by using the easiest method possible. Show work on a separate sheet for those problems that can't be done in your head.
a) What is $25 \%$ of 140 ?
b) What is $80 \%$ of 450 ?
c) What is $15 \%$ of 220 ?
d) What is $1 \%$ of 741 ?
e) What is $331 / 3 \%$ of 1200 ?
f) What is $831 / 3 \%$ of 12,000 ?
g) What is $160 \%$ of 25 ?
h) What is $0.02 \%$ of 3000 ?
i) 8 is what percent of 16 ?
j) 8 is what percent of 160 ?
k) 70 is what percent of 210 ?
2) 31 is what percent of 310 ?
m) 14 is what percent of 150 ?
n) 14 is what percent of 16 ?
o) 71 is $10 \%$ of what number?
p) 40 is $20 \%$ of what number?
q) 300 is $66^{2} / 3 \%$ of what number?
r) 78 is $17 \%$ of what number?
s) 5022 is $81 \%$ of what number?
3) Quickly Estimate.
a) What is $71 \%$ of 245 ?
b) What is $9 \%$ of 5630 ?
c) What is $43 \%$ of 7 ?
d) 19 is what percent of 82 ?
e) 63 is what percent of 130 ?
f) 8567 is what percent of 9100 ?
4) What do you end up with if you increase 55 by $40 \%$, and then decrease that result by $40 \%$ ?
5) Increase and decrease.
a) Going from 5200 up to 6500 is what percentage increase?
b) Going from 6500 down to 5200 is what percentage decrease?
c) Why were the answers to the above two problems different?

## Algebra - Sheet \#8

Signed Numbers
Simplify.

1) $-8-3$
2) $34-42$
3) $(4)(-7)$
4) $(-8)(-3)$
5) $(40) \div(-4)$
6) $(-20) \div(-5)$
7) $\frac{-20}{-5}$
8) $6 \cdot \frac{7}{-15}$
9) $\left(-\frac{4}{5}\right) \cdot\left(-\frac{5}{6}\right)$
10) $-7--10$
11) $-6+9+4-7$
12) $-2--7+-8$

Solving Equations
Solve each equation by getting X alone. Show what is done to each side. Check that your answers are correct.
13) $-5 \mathrm{X}=-40$
14) $X+7=-2$
15) $6 \mathrm{X}=-42$
16) $\mathrm{X} \div 4=8$
17) $\frac{x}{4}=8$
18) $7 \mathrm{X}-21=3 \mathrm{X}-9$
19) $8 \mathrm{X}+3-5 \mathrm{X}=7-4 \mathrm{X}-32$
20) $X-8-6 X=-7+X-3$
21) $6 \mathrm{X}-7=2 \mathrm{X}-10$
23) Challenge!
$7 \mathrm{X}+4-\mathrm{X}-8-11 \mathrm{X}-14=-12+49 \mathrm{X}+23-11-52 \mathrm{X}$
22) Challenge!
$\frac{1}{6} \mathrm{X}+\frac{2}{3}-\frac{3}{4} \mathrm{X}=-\frac{7}{10}+\frac{2}{3} \mathrm{X}-\frac{2}{5}$
24) Challenge!
$-\mathrm{X}-2 \frac{2}{3}-12 \mathrm{X}+13+5 \mathrm{X}-5 \frac{1}{2}=13 \frac{2}{3} \mathrm{X}+5-\frac{3}{4} \mathrm{X}-21 \frac{1}{6}-17 \frac{5}{12} \mathrm{X}$

## Solutions to Selected Problems

8) This is the same idea as problem \#8 on Sheet \#5. On this problem, one triangle has sides of length $21 / 2$ and $41 / 2$, which is a ratio of $9: 5$. Therefore the height of the tree is $9 / 5$ of it's shadow. $25 \cdot 9 / 5=\underline{45 \mathrm{ft}}$.
9) a) $\frac{5}{7} \cdot 28 \rightarrow \underline{\$ 20}$
b) $\frac{7}{5} \cdot 450 \rightarrow \underline{\$ 630}$
c) $5+7 \rightarrow 12 ; \quad \frac{5}{12} \cdot 360 \rightarrow \$ 150$ John;
$\frac{7}{12} \cdot 360 \rightarrow \underline{\$ 210 \text { Mary }}$
10) b) The first triangle tells us short:long $\rightarrow$ 2.6:4.9 ( $26: 49$ ) Therefore the long is $\frac{49}{26}$ short;
Second triangle tells us $x=\frac{49}{26} \cdot 3 \frac{1}{4} \rightarrow \underline{6} \underline{1}$ inches
11) b) $\frac{9}{2} \cdot 198 \rightarrow \underline{891}$
c) $\frac{2}{9} \cdot 198 \rightarrow \underline{44}$
d) $9+2 \rightarrow 11 ; \quad \frac{2}{11} \cdot 198 \rightarrow \underline{36 \text { goats; }}$

$$
\frac{9}{11} \cdot 192 \rightarrow \underline{162 \text { cows }}
$$

## Percents - Sheet \#1

3) $4800 \cdot 0.75 \rightarrow \underline{3600} ; 4800 \cdot \frac{3}{4} \rightarrow \underline{3600}$
4) We moved the decimal 2 over to the right. A percent is out of 100 and when we divide by 100 we move the decimal 2 over to the right.
5) Because it was not out of one hundred and therefore we could not just move the decimal two over to the left.
6) $21 / 2$ quarts $\rightarrow 80$ fl.oz; $\frac{3}{8} \cdot 80 \rightarrow \underline{30 \mathrm{fl} . \mathrm{oz} ;}$ $\frac{5}{8} 80 \rightarrow \underline{50 \mathrm{fl.oz}}$
7) $\frac{60}{7} \cdot \frac{60}{7} \rightarrow \frac{3600}{49} ; \quad \frac{3600}{49} \cdot \frac{60}{7} \rightarrow \frac{216000}{343}$ or $629 \frac{253}{343}$

## Percents - Sheet \#2

1) L) $0.081 \cdot 48000 \rightarrow \underline{3888}$
2) c) $\frac{11}{90} \rightarrow 11 \div 90 \rightarrow 0.1 \overline{2} \rightarrow \underline{12.2 \% \text { or } 12 \frac{2}{9} \underline{0} 0 .}$
g) $\frac{35}{56} \rightarrow 35 \div 56 \rightarrow 0.625 \rightarrow \underline{62.5 \% \text { or } 62 \frac{1}{2} \%}$
i) $\frac{527}{850} \rightarrow 527 \div 850$ (unless you knew it could be reduced by $17!) \rightarrow 0.62 \rightarrow \underline{62 \%}$
3) g) If you haven't memorized this, then you can do the following: $\frac{16 \frac{2}{3}}{100} \rightarrow \frac{\frac{50}{3}}{\frac{100}{1}} \rightarrow \frac{50}{3} \cdot \frac{1}{100} \rightarrow \frac{1}{6}$ and $0.1 \overline{6}$
4) $3.4 \cdot 5 \rightarrow 17 ; \quad 1 \cdot 5 \rightarrow 5 \quad \underline{17: 5}$
5) c) $15 \div 2 \frac{1}{2} \rightarrow 6 ; 1 \cdot 6 \rightarrow \underline{6 \text { cups }}$
6) $\frac{2}{9} \cdot 216 \rightarrow 48 ; ~ \frac{3}{9} \cdot 216 \rightarrow 72$;
$\frac{4}{9} \cdot 216 \rightarrow 96 ; \quad \$ 48, \$ 72, \$ 96$

## Percents - Sheet \#3

3) c) $\frac{12}{25} \rightarrow \frac{12 \cdot 4}{25 \cdot 4} \rightarrow \frac{48}{100} \rightarrow \underline{48 \%}$
d) $\frac{12}{55} \rightarrow 12 \div 55 \rightarrow 0.2 \overline{18}$
$\rightarrow \underline{21 . \overline{81} \%}$ or $21 \frac{9}{11} \%$
4) a) $20 \%$ of $45 \rightarrow \frac{1}{5}$ of $45 \rightarrow 9 ; 45+9=\underline{54}$
d) $80 \%$ of $45 \rightarrow \frac{4}{5}$ of $45 \rightarrow 36 ; 45-36 \rightarrow \underline{9}$
5) i) $0.008 \cdot 3500 \rightarrow \underline{28}$
6) b) 12 is $\frac{1}{4}$ of some number. That number is then $12 \cdot \frac{5}{1} \rightarrow \underline{48}$
c) 13 is $\frac{1}{10}$ of some number. That number is then

$$
13 \cdot \frac{10}{1} \rightarrow \underline{130}
$$

8) $\frac{7}{100} \cdot \frac{250}{1} \rightarrow \frac{175}{10} ; \quad 17.5+250 \rightarrow \underline{\$ 267.50}$
9) $\frac{1}{5} \cdot 300 \rightarrow 60 ; \quad 300-60 \rightarrow \underline{\$ 240}$
10) c) $3+4 \rightarrow 7 ; \quad \frac{4}{7}$
d) $\frac{3}{7} \cdot 35 \rightarrow \underline{15 \text { boys; }} \frac{4}{7} \cdot 35 \rightarrow \underline{20 \text { girls }}$
11) $\mathrm{x}=\frac{5}{8} \cdot \frac{7}{1} \rightarrow \frac{35}{8} ; 35 \div 8 \rightarrow 4 \frac{3}{8}$ or $\underline{4.375 \mathrm{~cm}}$
12) $\frac{3}{5} \cdot 330 \rightarrow \underline{\$ 198}$

## Answer Key

Ratios I - Sheet \#4

1) a) 10 cups
b) 20 cups
c) $3 \frac{1}{5}$ cups
d) $21 / 2$ cups
2) a) $2 \cdot \mathrm{~A}=5 \cdot \mathrm{~W}$

Twice the number (\#) of aluminum bats is equal to 5 times the \# of wooden bats.

$$
\mathrm{A}=5 / 2 \mathrm{~W}
$$

The \# of aluminum bats is $5 / 2$ the \# of wooden bats.

$$
\mathrm{W}=2 / 5 \mathrm{~A}
$$

The \# of wooden bats is $2 / 5$ the \# of aluminum bats.
b) 100
c) 20
d) $5 / 7$
e) $2 / 7$
f) 18 wooden and 45 aluminum
3) a) 216
b) 45
c) 280 girls, 350 boys
4) a) 6 cm
b) 36 cm
c) 12.25 cm
5) a) $\mathrm{F}: \mathrm{S}=4: 5$
b) $5 \cdot \mathrm{~F}=4 \cdot \mathrm{~S}$
$\mathrm{F}=4 / 5 \mathrm{~S}$
$\mathrm{S}=5 / 4 \mathrm{~F}$
c) $\mathrm{S}: \mathrm{F}=5: 4$
d) Same answers as for part B.
e) $\mathrm{S}: \mathrm{J}=1.2: 1$
f) $\mathrm{S}=1.2 \cdot \mathrm{~J}$ $\mathrm{J}=\mathrm{S} \div 1.2$
g) $\mathrm{J}: \mathrm{S}=0.8 \overline{3}: 1$
h) $\mathrm{J}=0.8 \overline{3} \cdot \mathrm{~S}$
$\mathrm{S}=\mathrm{J} \div 0.8 \overline{3}$
6) a) $5 / 3$
b) $9 / 2$
c) $2 / 9$
d) $2 / 7$
e) $1 / 7$
f) 2.5
g) 0.3125
7) a) $\mathrm{Y}: \mathrm{X}=15: 7$
b) $\mathrm{B}: \mathrm{A}=2: 3$
c) $\mathrm{L}: \mathrm{G}=22: 17$
d) $\mathrm{J}: \mathrm{H}=0 . \overline{5}: 1$
e) $\mathrm{Q}: \mathrm{E}=1.6: 1$

Ratios I - Sheet \#5

1) a) $\mathrm{B}: \mathrm{F}=12: 5$
b) $5 \cdot \mathrm{~B}=12 \cdot \mathrm{~F}$
$\mathrm{F}=5 /{ }_{12} \mathrm{~B}$
$\mathrm{B}=12 / 5 \mathrm{~F}$
c) $\mathrm{F}: \mathrm{B}=5: 12$
d) Same answers as part B
e) $\mathrm{B}: \mathrm{F}=2.4: 1$
f) $\mathrm{B}=2.4 \cdot \mathrm{~F}$
$\mathrm{F}=\mathrm{B} \div 2.4$
g) $\mathrm{F}: \mathrm{B}=0.41 \overline{6}: 1$
h) $\mathrm{F}=0.41 \overline{6} \cdot \mathrm{~B}$
$\mathrm{B}=\mathrm{F} \div 0.41 \overline{6}$
2) a) $\mathrm{G}: \mathrm{B}=5: 7$
b) $\mathrm{D}: \mathrm{H}=7: 2$
c) $\mathrm{X}: \mathrm{Y}=0.4: 1$
d) $\mathrm{Y}: \mathrm{X}=2.5: 1$
3) a) $\mathrm{B}: \mathrm{G}=1.4: 1$
b) $\mathrm{H}: \mathrm{D}=2 . \overline{6}: 1$
4) a) $X: Z=43: 10$
b) $\mathrm{K}: \mathrm{J}=13: 4$
5) a) $116 \frac{2}{3} \mathrm{ft}$.
b) 5.4 m
6) a) $5 \cdot \mathrm{G}=13 \cdot \mathrm{C}$
$\mathrm{C}=5 /{ }_{13} \mathrm{G}$
$\mathrm{G}=13 / 5 \mathrm{C}$
b) 91
c) 20
d) 150 cows, 390 goats
7) $1 \frac{17}{28}$ cups
8) $291 / 4 \mathrm{ft}$.
9) 4
10) 12
11) 6
12) 990
13) 440
14) 63,000
15) 4600
16) 16
17) 0.00003
18) 11,000
19) 3112
20) 0.085
21) 120
22) 2500
23) 50
24) $2 \frac{11}{15}$
25) $21 \frac{7}{333}$

## Ratios I - Sheet \#6

1) a) $16: 3$
b) $5 \cdot \overline{3}: 1$
c) $31 / 3$ cups
d) $3 \frac{3}{8} \mathrm{fl} . \mathrm{oz}$.
2) a) $X: Y=3.6: 1$
b) $\mathrm{Y}: \mathrm{X}=0.2 \overline{7}: 1$
3) a) $X: Y=7: 2$
b) $\mathrm{M}: \mathrm{K}=8: 25$
4) a) 27
b) $3 / 5$
c) $2 / 5$
d) 18 boys, 12 girls
5) 48fl.oz. and $80 \mathrm{fl} . \mathrm{oz}$.
6) $\mathrm{L}: \mathrm{W}=12: 5$
$\mathrm{W}: \mathrm{L}=5: 12$
$\mathrm{L}: \mathrm{W}=2.4: 1$
$\mathrm{W}: \mathrm{L}=0.41 \overline{6}: 1$
7) 8.25 mm
8) $X=14 ", Y=91 / 3^{\prime \prime}$
9) a) 490
b) 90
c) $631^{\text {st }}$ class,

147 Economy
10) $\frac{5}{36}$
11) $10 \frac{1}{8}$
12) $2 \frac{22}{25}$
13) $21 / 2$

Ratios I - Sheet \#7

1) $X=1.5 \mathrm{~cm}, Y=1.875 \mathrm{~cm}$
2) a) $35: 36$
b) $0.97 \overline{2}: 1$
3) a) $\mathrm{G}: \mathrm{B}=5: 11$
b) $\mathrm{D}: \mathrm{H}=13: 3$
c) $\mathrm{W}: \mathrm{R}=1 . \overline{1}: 1$
d) $\mathrm{Y}: \mathrm{X}=0.2 \overline{7}: 1$
4) 
5) $\mathrm{H}: \mathrm{D}=17: 8$
6) 24,40 , and 64 fl.oz.
7) $\$ 250, \$ 150, \$ 100, \$ 50$
8) 45 ft .
9) $\mathrm{B}: \mathrm{H}=9: 5$
$\mathrm{H}: \mathrm{B}=5: 9$
$\mathrm{B}: \mathrm{H}=1.8: 1$
$\mathrm{H}: \mathrm{B}=0 . \overline{5}: 1$
10) a) $\$ 20$
b) $\$ 630$
c) John has $\$ 150$

Mary has \$210
11) a) 21 ft .
b) $6 \frac{1}{8}$ inches
12) a) $9 \cdot G=2 \cdot \mathrm{C}$ 9 times the \# of goats is equal to twice the \# of cows.

$$
\mathrm{C}=9 / 2 \mathrm{G}
$$

The \# of cows is $9 / 2$
times the \# of goats.

$$
\mathrm{G}=2 / 9 \mathrm{C}
$$

The \# of goats is $2 / 9$ times the \# of cows.
b) 891
c) 44
d) 36 goats, 162 cows
13) $8315 . \overline{5}$
14) $9 \frac{49}{64}$
15) $383^{1 / 3}$
16) $2 \frac{21}{40}$
17) 315.27
18) 0.00004

## Percents - Sheet \#1

1) a) $\frac{21}{100}, 0.21$
b) $1 / 4,0.25$
c) $1 / 2,0.5$
d) $\frac{53}{100}, 0.53$
e) $\frac{7}{100}, 0.07$
f) $\frac{1}{20}, 0.05$
2) a) 0.75
b) $3 / 4$
3) 3600
4) a) Fraction or decimal, 63
b) Fraction, 90
c) Decimal, 205.1
d) Fraction or decimal, 80
5) $37 \%$
6) Answers may vary.
7) a) $75 \%$
b) $40 \%$
c) $90 \%$
d) $29 \%$
8) Answers may vary.
