## Number Bases - Practice Sheet \#2

1) Fill in the table.

|  | Egyptian | Decimal | Scientific |
| :--- | :---: | :---: | :---: |
| a) |  |  | $6.02 \cdot 10^{4}$ |
| b) |  | 350 |  |
| c) | $7777 \$ \Omega / 11 \cap$ |  |  |
| d) |  |  | $3.041 \cdot 10^{3}$ |
| e) |  | 43,530 |  |

2) Convert to standard decimal form.
a) $5.03 \cdot 10^{5}$
b) $5.03 \cdot 10^{-3}$
c) $5.03 \cdot 10^{-9}$
d) $5.03 \cdot 10^{0}$
3) Convert to scientific notation.
a) 65200
b) $700,000,000$
c) 0.0000063
d) 0.000408
e) 8.2
4) Convert to expanded notation.
a) 652
b) 8327
c) 70,800
5) Convert to standard decimal form.
a) $5 \cdot 10^{2}+4 \cdot 10^{1}+3 \cdot 10^{0}$
b) $8 \cdot 10^{6}+3 \cdot 10^{4}$
c) $7 \cdot 10^{3}+2 \cdot 10^{2}+6 \cdot 10^{0}$
6) Write down the four numbers that follow each octal (base-eight) number.
a) 6 oct
b) $25_{\text {oct }}$
c) $46_{\text {oct }}$
d) $52_{\text {oct }}$
e) $75_{\text {oct }}$
f) $65_{\text {oct }}$
g) $146_{\text {oct }}$
7) Write each octal number in expanded notation.
a) $73_{\text {oct }}$
b) $163_{\text {oct }}$
c) $345_{\text {oct }}$
8) Convert from octal (base-eight) to decimal (base-ten).
a) 37 oct
b) 52 oct
c) 5 oct
d) $107_{\text {oct }}$
e) $234{ }_{\text {oct }}$
9) Convert from decimal to octal.
a) $23_{\mathrm{dec}}$
b) $39_{\mathrm{dec}}$
c) 67 dec
d) $80_{\mathrm{dec}}$

## Mensuration - Practice Sheet \#1

Note: In this entire unit, you are allowed to use the Table of Square Roots found at the back of this book. However, you will need to use the square root algorithm to calculate the square roots of numbers greater than 100 .

1) Find the variables.
a) (Two of the lines are parallel.)

b)

c)

2) In this parallelogram, what is the sum of the measures of the four angles?

3) Calculate the area.
a)

b)

4) The four ratios of a circle are:

$$
\begin{aligned}
& C: D \approx 22: 7 \\
& D: C \approx 7: 22 \\
& C: D \approx 3.14: 1 \\
& D: C \approx 0.318: 1
\end{aligned}
$$

Answer each question using one of the above ratios.
a) What is the circumference of a circle that has a diameter of 35 m ?
b) What is the circumference of a circle that has a diameter of 3 m ?
c) What is the diameter of a circle that has a circumference of 44 m ?
d) What is the diameter of a circle that has a circumference of 20 m ?
5) Calculate the area.
a)

b)

c)

d)

e)


## Mensuration - Group Sheet \#2

1) We have seen the formula $\quad \mathbf{V}=\mathbf{A}_{\text {Base }} \cdot \mathbf{H}$, which is used for calculating the volume of a box, a prism (e.g.
triangular), or a cylinder.
Around 430 b.C.,
Democritus, who was
Greek, discovered that the volume of a pyramid is exactly $1 / 3$ the volume of the box that it fits into (i.e., they have the same base and height). Similarly, the volume of a cone is $1 / 3$ the volume of the cylinder that it fits into.
This gives us the formula:

$$
\mathbf{V}=1 / 3 \mathbf{A}_{\text {Base }} \cdot \mathbf{H}
$$

Calculate the volume of each solid.
a) A pyramid has a total height of 150 feet, and its square base measures 200 feet on each side.
b) A cone.

b) What is the volume of a sphere that has a diameter of 18 cm ?

## Percents \& Growth - Practice Sheet \#4

1) Use the Growth Rate Table.
a) Annie put $\$ 100$ into a savings account that earns 3\% APR. What will the balance of the account be after 20 years?
b) The population of a city is about 100,000 , and is increasing by $2.5 \%$ per year. Approximately, what will its population be in 50 years, if that growth rate continues?
c) The value of a certain stock is currently increasing by $30 \%$ annually. If it now is valued at $\$ 40$ per share, then about how much will it be worth after 12 years, if that growth rate continues?
2) Use the Rule of 72 to quickly answer each.
a) How long does it take for your money to double at a return rate on your investment of $7 \%$ per year?
b) The price of real estate in Clifton doubled over an eight-year period. What was the average annual growth rate over that period?

You may use a calculator for the rest of this sheet. You must write down what you put into your calculator. As always, round your answer to three significant digits, when necessary.
3) What is...
a) $7 \%$ of 89.3 ?
b) $1.3 \%$ of 730 ?
c) $0.04 \%$ of 34,200 ?
d) $320 \%$ of 45 ?
e) 458 increased by $12 \%$ ?
f) 6700 decreased by $60 \%$ ?
4) 18 is what percent...
a) of 37 ?
b) of 370 ?
c) of 3700 ?
d) of 5 ?
5) What percentage increase is it going from...
a) 480 up to 552 ?
b) 3500 up to 3654 ?
c) 65 up to 150 ?
6) What percentage decrease is it going from...
a) 420 down to 357 ?
b) 63,500 down to 12,700 ?
7) a) 456 is $38 \%$ of what?
b) 456 is $2.4 \%$ of what?
c) 72 is $60 \%$ more than what?
d) 9 is $7.1 \%$ more than what?
e) 770 is $12 \%$ less than what?

## Word Problems.

8) A bike normally listed for $\$ 320$ is on sale for a $30 \%$ discount. What is the new discounted price?
9) Kate bought a house for $\$ 198,000$ and then sold it for $\$ 230,000$ one year later. What is the profit as a percentage?
10) Fred bought a house for $\$ 230,000$ and then sold it for $\$ 198,000$ one year later. What is the loss as a percentage?
11) Ed is $64 \%$ as tall as Joe.
a) How tall is Ed if Joe is 120 cm tall?
b) How tall is Joe if Ed is 120 cm tall?
12) TJ is $8 \%$ taller than Pat.
a) How tall is TJ if Pat is 135 cm tall?
b) How tall is Pat if TJ is 135 cm tall?
13) A bank account increases by $7 \%$ per year for 5 years. What is the percentage increase over the 5 -year period?

## Algebra - Practice Sheet \#2

## Formulas

1) Convert $59^{\circ} \mathrm{F}$ to ${ }^{\circ} \mathrm{C}$.
2) Convert $-5^{\circ} \mathrm{C}$ to ${ }^{\circ} \mathrm{F}$.
3) Convert $70^{\circ} \mathrm{F}$ to ${ }^{\circ} \mathrm{C}$.
4) Convert $42^{\circ} \mathrm{C}$ to ${ }^{\circ} \mathrm{F}$.
5) Calculate the distance that an object falls after being dropped for $1 \frac{1}{2}$ seconds.

Signed Numbers
Simplify.
6) $-2+7$
7) $-5+3$
8) $-5-3$
9) $(24) \div(-2)$
10) $(-24) \div(2)$
11) $\frac{-24}{2}$
12) $(-24) \div(-2)$
13) $\frac{-24}{-2}$
14) $13--8$
15) $7-+2$
16) $7+-2$
17) $-6--2+-3-+4$

## Expressions

Simplify by combining like terms.
18) $X-7-3 X-8$
19) $-3 \mathrm{X}-7+\mathrm{X}-9$
20) $-\mathrm{X}-2-6 \mathrm{X}+8$
21) $-6-4+2-9+4$
22) $-2+-9--4-+1$

Order of Operations
Simplify.
23) $5+3 \cdot 2$
24) $(5+3) \cdot 2$
25) $7-5 \cdot 3$
26) $(7-5) \cdot 3$
27) $4 \cdot 5^{2}$
28) $(4 \cdot 5)^{2}$
29) $8+20 \div 4$

Distributive Property Simplify.
30) $4(3 \mathrm{X}-5)$
31) $3(X+7)$
32) $-6(7 \mathrm{X}+4)$
33) $-3(X-4)$

## Equations

Solve each equation by getting X alone. Show what is done to each side.
34) $\mathrm{X}-8=12$
35) $8 \mathrm{X}=40$
36) $8 \mathrm{X}=-40$
37) $-8 \mathrm{X}=-40$
38) $-8+\mathrm{X}=40$
39) $3 \mathrm{X}-1=5 \mathrm{X}+9$
40) $7 \mathrm{X}+5=9 \mathrm{X}+17$
41) $5 \mathrm{X}-7=-\mathrm{X}+3$

## Algebra - Practice Sheet \#6

Simplify.

1) $4+3 \cdot 9$
2) $6-5 \cdot 3+20$
3) $7 \cdot 3+12 \div(9-10)$
4) $30-10 \cdot 3^{2}$
5) $c^{4} \cdot c^{5}$
6) $c^{3} \cdot x^{2}$
7) $x^{2} \cdot x^{5}$
8) $\left(x^{2}\right)^{5}$
9) $\left(x^{5}\right)^{2}$
10) $5 x^{7}+8 x^{7}$
11) $x^{3}-5 x^{3}$
12) $5 x^{4}+3 x^{3}$

Evaluate each expression
given that $x=3 ; y=-4$.
13) $5 y-6 x+3$

Solve each equation.
15) $6 X=-\frac{4}{5}$
16) $-8 \mathrm{X}=-3$
17) $-2 \frac{2}{3} X=-\frac{4}{7}$
18) $2 \frac{2}{3}-X=-\frac{4}{7}$
19) $-6 \mathrm{X}-11=-\mathrm{X}-14$
20) $\frac{-5}{3 \mathrm{X}+1}=\frac{2}{2 \mathrm{X}-3}$
23) $\frac{3}{5}+\frac{1}{2}(3 X-1)=\frac{2}{5}\left(\frac{3}{2} X-2\right)-1 \frac{1}{2}$
21) $-8 \mathrm{X}+3-5 \mathrm{X}=7+2(\mathrm{X}-7)$
22) $\frac{2}{9}\left(3 \mathrm{X}-\frac{1}{2}\right)=\frac{1}{5} \mathrm{X}+\frac{1}{3}$

$$
9\left(J N-\frac{2}{2}\right)
$$

14) $y^{2}-x y+4$
15) $8+2(3 \mathrm{X}-4)-3 \mathrm{X}-4(\mathrm{X}+7)=5-3(\mathrm{X}-6)+3 \mathrm{X}+8(3-2 \mathrm{X})$
16) Challenge! $\frac{2}{5} \mathrm{X}-8 \frac{1}{8}-\frac{3}{4}\left(\frac{14}{15} \mathrm{X}-5 \frac{5}{9}\right)=2 \frac{7}{10} \mathrm{X}-2 \frac{5}{6}+\frac{3}{4}\left(\mathrm{X}+5 \frac{1}{6}\right)$
