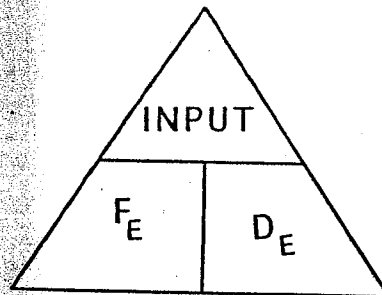
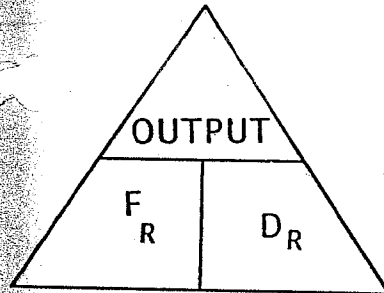
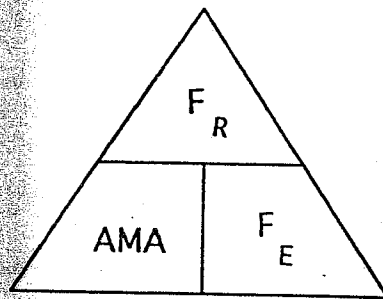
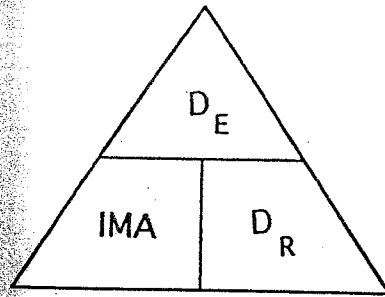


ION EQUATION SHEET



$$\text{EFFICIENCY} = \frac{AMA}{IMA} \times 100 = \frac{\text{OUTPUT}}{\text{INPUT}} \times 100$$

AMA - ALWAYS LESS THAN IMA

OUTPUT - ALWAYS LESS THAN INPUT

Name Key Date _____

Mechanical Advantage (MA) and Efficiency Practice Problems
Draw your Triangles!

1. What is the mechanical advantage when a force of 8 N is applied to a machine that exerts a force of 24 N?

<u>Formula</u>	<u>Set-up</u>	<u>Answer/Units</u>
$MA = \frac{F_R}{F_E}$	$\frac{24\text{ N}}{8\text{ N}}$	3

2. What is the force applied on a machine that has a mechanical advantage of 2 and a resistance or output force of 6 N?

<u>Formula</u>	<u>Set-up</u>	<u>Answer/Units</u>
$F_E = \frac{F_R}{MA}$	$\frac{6\text{ N}}{2}$	3 N

3. Calculate the efficiency of a machine that moves a 540 N object a distance of 4 m and has an input work of 3,000 J?

<u>Formula</u>	<u>Set-up</u>	<u>Answer/Units</u>
$E = \frac{OW}{IW} \times 100$	$\frac{(540 \times 4)}{3,000} \times 100$	72%

4. What is the output work of a machine that is 56% efficient when a 9 N force is applied over a distance of 6 m?

<u>Formula</u>	<u>Set-up</u>	<u>Answer/Units</u>
$W = \frac{E \times IW}{100}$	$.56 \times (9\text{ N} \times 6\text{ m})$	30 J

Name _____ Date _____

Mechanical Advantage (MA) and Efficiency Practice Problems

Draw your Triangles!

1. What is the mechanical advantage when a force of 8 N is applied to a machine that exerts a force of 24 N?

Formula Set-up Answer/Units

$MA = \frac{F_r}{F_e}$ $\frac{24\text{ N}}{8\text{ N}}$ 3

2. What is the force applied on a machine that has a mechanical advantage of 2 and a resistance or output force of 6 N?

Formula Set-up Answer/Units

$F_e = \frac{F_r}{MA}$ $\frac{6\text{ N}}{2}$ 3 N

3. Calculate the efficiency of a machine that moves a 540 N object a distance of 4 m and has an input work of 3,000 J?

Formula Set-up Answer/Units

$\text{Eff} = \frac{W_{out}}{W_{in}} \times 100$ $\frac{540 \times 4}{3000} \times 100$ 72%

4. What is the output work of a machine that is 56% efficient when a 9 N force is applied over a distance of 6 m?

Formula Set-up Answer/Units

$W_{out} = \frac{\text{Eff}}{100} \times F_e \times d$ $(.56) \times 9 \times 6$ 28.8 J

Name _____

Date _____

Mechanical Advantage (MA) and Efficiency Practice Problems

Draw your Triangles!

1. What is the MA of a machine that has an output force of 10 N and an input force of 5 N?

Formula	Set-up	Answer/Units
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$$\frac{10}{5}$$

2

2. What is the output force of a machine with an input force of 2 N and a MA of 4 N?

Formula	Set-up	Answer/Units
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$$4 \cdot 2$$

8 N

3. Calculate the efficiency of a machine with an output work of 5 J and an input work of 6 J.

Formula	Set-up	Answer/Units
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$$\frac{5}{6}$$

83%

4. Determine the efficiency of a machine that as an output work of 10 J and an input work of 15 J.

Formula	Set-up	Answer/Units
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$$\frac{10}{15}$$

66.6%