P11 - 1.3 - Isolating variables *Notes* **Algebra**

$a + b = c$ *Solve for "a"*

$+ = -$

$a + b = c$
$-b \quad -b$ *Subtract "b" from both sides*
$a = c - b$

$a + b = c$
$a = c - b$ *Bring "b" over, change sign*

$v = \frac{d}{t}$

Solve for d

$v = \frac{d}{t}$
$t \times v = \frac{d}{t} \times t$ *× both sides by "t"*
$tv = d$ *Simplify*
$d = vt$ *Mirror*

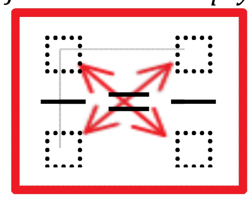
Solve for t

$v = \frac{d}{t}$
$t \times v = \frac{d}{t} \times t$ *× both sides by "t"*
$tv = d$ *÷ both sides by "v"*
$\frac{tv}{v} = \frac{d}{v}$
$t = \frac{d}{v}$

Bring t up
Bring v down

$v = \frac{d}{t}$ *Bring t up*
$tv = d$ *Mirror*
$d = vt$

Just cross multiply!



$v = \frac{d}{t}$
$t = \frac{d}{v}$ *Switch v and t*

$\frac{a}{b} = \frac{c}{d}$

Solve for "a"
$\frac{a}{b} = \frac{c}{d}$
$a = \frac{cb}{d}$
Bring "b" up

Solve for c
$\frac{a}{b} = \frac{c}{d}$
$\frac{ad}{b} = c$
$c = \frac{ad}{b}$
Bring "d" up
Mirror

Solve for b
$\frac{a}{b} = \frac{c}{d}$
$a = \frac{cb}{d}$ *Bring b up*
$ad = cb$ *Bring d up*
$\frac{ad}{c} = b$ *Bring c down*
$b = \frac{ad}{c}$ *Mirror*

Solve for "d"
$\frac{a}{b} = \frac{c}{d}$ *Bring d up*
$\frac{ad}{b} = c$ *Bring b up*
$ad = cb$ *Bring "a" down*
$d = \frac{cb}{a}$

$\sin\theta = \frac{O}{H}$ → $O = H\sin\theta$

$\sin\theta = \frac{O}{H}$ → $H = \frac{O}{\sin\theta}$

$\cos\theta = \frac{A}{H}$ → $A = H\cos\theta$

$\cos\theta = \frac{A}{H}$ → $H = \frac{A}{\cos\theta}$

$\tan\theta = \frac{O}{A}$ → $O = A\tan\theta$

$\tan\theta = \frac{O}{A}$ → $A = \frac{O}{\tan\theta}$

$v_f = v_i + at$ *Solve for v_i*

$v = v_0 \pm at$

0 = *at time zero*
$\pm$: *+ve "a", −ve "a"*

$v_f = v_i + at$
$-at \quad -at$ *Subtract "at" from both sides*
$v_f - at = v_i$ *Mirror*
$v_i = v_f - at$

$v_f = v_i + at$ *Bring it over*
$v_i = v_f - at$ *Change sign*
Mirror

$v_f = v_i + at$ *Solve for "t"*
$v_f - v_i = at$
$\frac{v_f - v_i}{a} = \frac{at}{a}$ *Subtract v_i from both sides*
$\frac{v_f - v_i}{a} = t$ *Divide both sides by "a"*
$t = \frac{v_f - v_i}{a}$ *Mirror*

$v_f = v_i + at$ *Bring "v_0" over*
$t = \frac{v_f - v_i}{a}$ *Bring "a" down*
Mirror

P11 - 1.3 - Isolating variables *Notes* **Algebra**

$a^2+b^2=c^2$

Solve for c

$a^2+b^2=c^2$
$\sqrt{a^2+b^2}=\sqrt{c^2}$ — *Square root both sides*
$\sqrt{a^2+b^2}=c$ — *Mirror*
$c=\sqrt{a^2+b^2}$

Solve for "a"

$a^2+b^2=c^2$
$a^2=c^2-b^2$ — *Bring b^2 over*
$\sqrt{a^2}=\sqrt{c^2-b^2}$ — *Square root both sides*
$a=\sqrt{c^2-b^2}$

$v_f^2=v_i^2+2ad$

Solve for v_f

$v_f^2=v_i^2+2ad$
$\sqrt{v_f^2}=\sqrt{v_i^2+2ad}$
$v_f=\sqrt{v_i^2+2ad}$

Square root both sides

Solve for v_i

$v_f^2=v_i^2+2ad$
$v_f^2-2ad=v_i^2$
$\sqrt{v_f^2-2ad}=v_i$
$v_i=\sqrt{v_f^2-2ad}$

Bring 2ad over
Square root both sides

Solve for "a"

$v_f^2=v_i^2+2ad$
$v_f^2-v_i^2=2ad$
$\frac{v_f^2-v_i^2}{2d}=a$
$a=\frac{v_f^2-v_i^2}{2d}$

Bring v_i^2 over
Bring 2a down

Solve for d

$v_f^2=v_i^2+2ad$
$v_f^2-v_i^2=2ad$
$\frac{v_f^2-v_i^2}{2a}=d$
$d=\frac{v_f^2-v_i^2}{2d}$

Bring v_i^2 over
Bring 2d down

$d=v_it+\frac{1}{2}at^2$

Solve for a

$d=v_it+\frac{1}{2}at^2$
$d-v_it=\frac{1}{2}at^2$ — *Bring v_it over*
$\frac{2(d-v_it)}{t^2}=a$ — *Bring 2 up (Brackets!)*, *Bring t^2 down*
$a=\frac{2(d-v_it)}{t^2}$

Solve for t

$d=v_it+\frac{1}{2}at^2$
$0=\frac{1}{2}at^2+v_it-d$

Quadform

Solve for v_i

$d=v_it+\frac{1}{2}at^2$
$d-\frac{1}{2}at^2=v_it$ — *Bring $\frac{1}{2}at^2$ over*
$\frac{d-\frac{1}{2}at^2}{t}=v_i$ — *Bring t*
$v_i=\frac{d-\frac{1}{2}at^2}{t}$