

Skyndipróf 2 í burðarþolsfræði, apríl 2004, dæmi 2.

```
> restart;
```

```
> f:=theta -> (ex+ey)/2+(ex-ey)/2*cos(theta*2)+gam/2*sin(2*theta);
```

$$f := \theta \rightarrow \frac{1}{2}ex + \frac{1}{2}ey + \frac{1}{2}(ex - ey)\cos(2\theta) + \frac{1}{2}gam\sin(2\theta)$$

Jöfnur fyrir epsilon, theta er 0, 60 og 120 (ath 2*theta í jöfnunni)

```
> theta1:=0: theta2:=60/180*Pi: theta3:=120*Pi/180;
```

$$\theta_3 := \frac{2}{3}\pi$$

```
> jofnur:= {ea=f(theta1), eb=f(theta2), ec=f(theta3)};
```

$$jofnur := \left\{ ea = ex, eb = \frac{1}{4}ex + \frac{3}{4}ey + \frac{1}{4}gam\sqrt{3}, ec = \frac{1}{4}ex + \frac{3}{4}ey - \frac{1}{4}gam\sqrt{3} \right\}$$

```
> lausn:=solve( jofnur, {ex,ey,gam});
```

 Leysi þessar þrjár jöfnur m.t.t. ex, ey og gamma:

$$lausn := \left\{ ey = \frac{2}{3}eb - \frac{1}{3}ea + \frac{2}{3}ec, gam = \frac{2}{3}\sqrt{3}(-ec + eb), ex = ea \right\}$$

```
> assign(lausn);
```

 Þetta er lausnin á ex, ey og gamma, set þau gildi inn

```
> ea:=-150: eb:=500: ec:=600:
```

 Þetta eru mæld gildi:

```
> ex; evalf(ey); evalf(gam);
```

-150
783.3333333
-115.4700539

Hornið sem höfuðásinnr myndar, hitt er +90°

```
> horn1:=solve( tan(2*theta)=gam/(ex-ey), theta): evalf(horn1*180/Pi);
```

3.526338516

```
> epsilon1:=evalf(f(horn1)); epsilon2:=evalf(f(horn1+Pi/2));
```

 Höfuðtognanirnar eru:

$\epsilon_1 := -153.5578659$
 $\epsilon_2 := 786.8911993$

```
> epsilon2:=ex+ey-epsilon1;
```

 Einnig má finna skv summureglunni:

$\epsilon_2 := 786.8911992$

```
> gammaxy:=theta -> -(ex-ey)/2*sin(theta*2)+gam/2*cos(2*theta);
```

$$gammaxy := \theta \rightarrow -\frac{1}{2}(ex - ey)\sin(2\theta) + \frac{1}{2}gam\cos(2\theta)$$

```
> gammaxy(horn1);
```

 Þetta á að vera 0... passar.

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