

Matematik B Onsdag 9/9 2015

- Fremmødere registrering.
- Opsamling fra sidst:
- Nyt stof: Mere om linjer. B2 side 11-19. Formelsamling (49). Ortogonale linjer (tillæg til formelsamling + supplerende note). Vinkler mellem linjer (disse tavlenoter).
- Eksempel på skæring og vinkelberegning.
- Bevis for sætningen om ortogonale linjer (se eksamensspørgsmål).
- Træning i beviserne til i morgen.

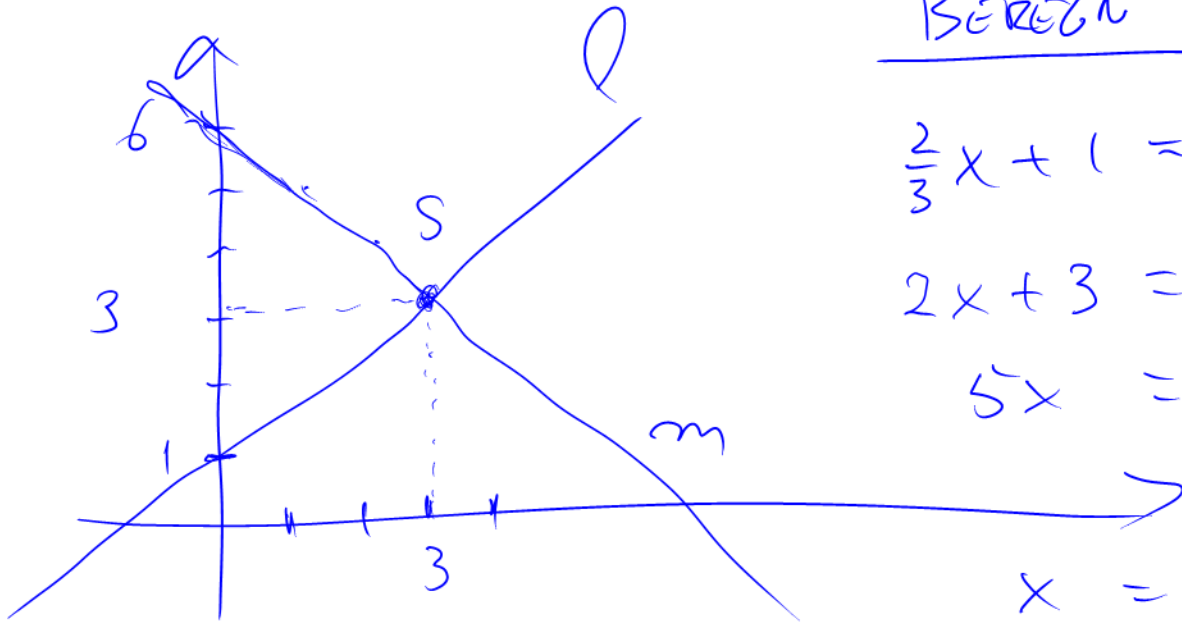
EKS 2.1

$$l: y = \frac{2}{3}x + 1$$

$$m: y = -x + 6 \quad ((-1) \cdot x + 6)$$

$$y = ax + b$$

$$a = \frac{\Delta y}{\Delta x}$$



$$\underline{\underline{S = (3, 3)}}$$

BEREKN SKÆRING

$$\frac{2}{3}x + 1 = -x + 6$$

$$2x + 3 = -3x + 18$$

$$5x = 15$$

$$\underline{x} = \frac{15}{5} = \underline{3}$$

SKÆR I l (eller m)

$$l: y = \frac{2}{3} \cdot 3 + 1 = 2 + 1 = \underline{3}$$

EKS 2.1

$$l : y = \frac{2}{3}x + 1$$

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$$y = ax + b$$

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BETEGU VINKEL


$$\tan v = \frac{a}{1} = a$$

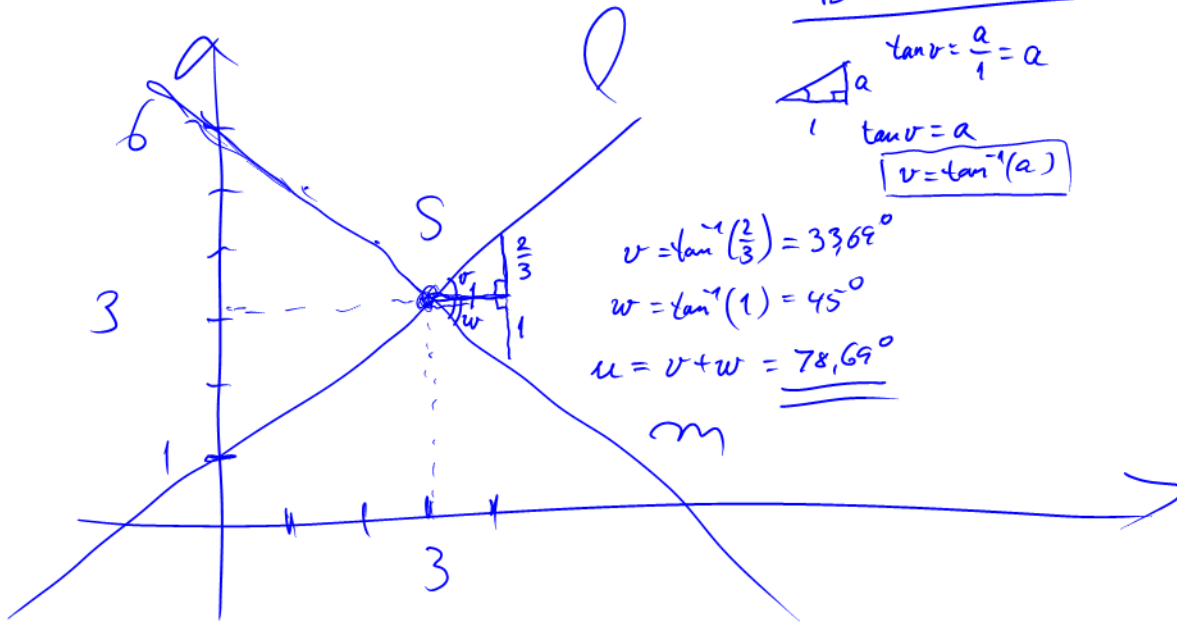
$$\tan v = a$$

$$v = \tan^{-1}(a)$$

$$v = \tan^{-1}\left(\frac{2}{3}\right) = 33,69^\circ$$

$$w = \tan^{-1}(1) = 45^\circ$$

$$u = v + w = \underline{\underline{78,69^\circ}}$$



$$\underline{\underline{S = (3,3)}}$$

$$y = ax + b \leftarrow \text{STANDARD FORM (S.F.)}$$

$$3x + 6y - 4 = 0 \leftarrow \text{LINEAR S.F.}$$

ISOLATE y :

$$6y = -3x + 4$$

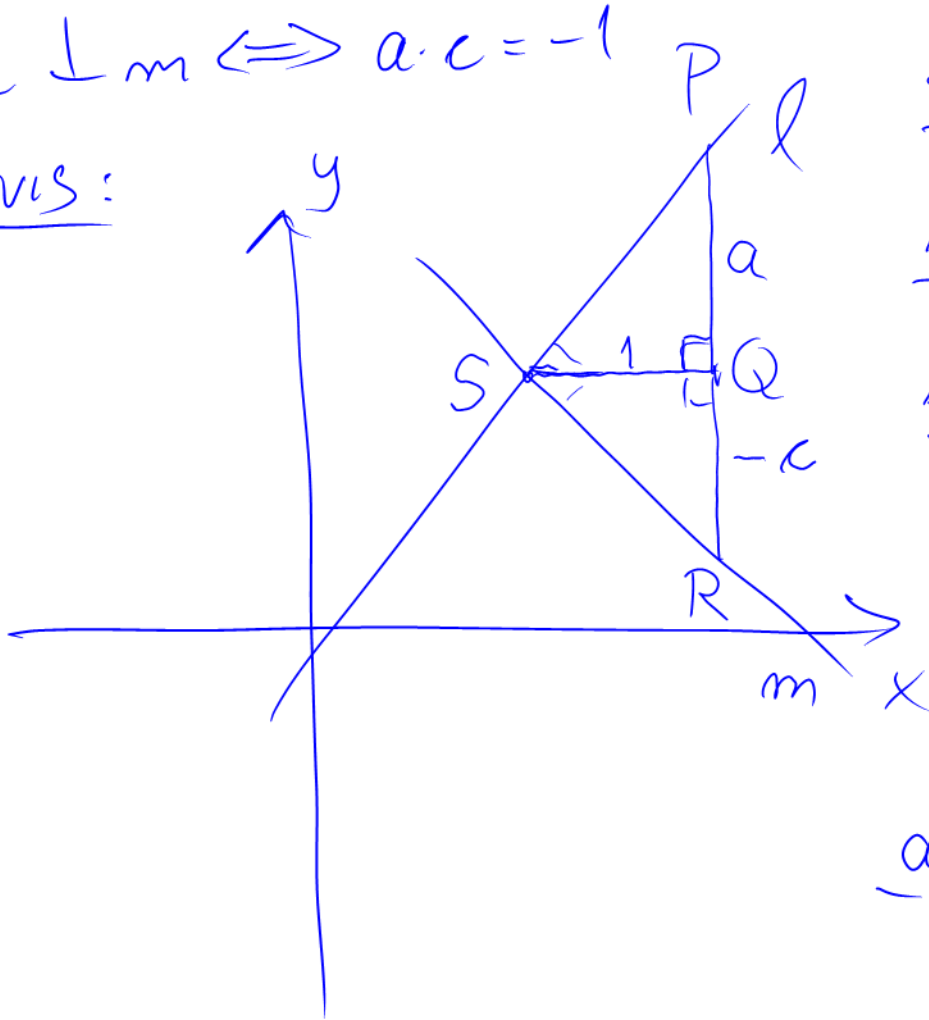
$$y = \frac{-3x + 4}{6} = \frac{-3x}{6} + \frac{4}{6} = -\frac{1}{2}x + \frac{2}{3}$$

GIVEN TO LINEAR $l: y = ax + b$ $a > 0$

$m: y = cx + d$ $c < 0$

$$l \perp m \Leftrightarrow a \cdot c = -1$$

PROOF:



ΔSQP

$$|SP|^2 = 1^2 + a^2 = 1 + a^2$$

ΔSQR

$$|SR|^2 = 1^2 + (-c)^2 = 1 + c^2$$

ΔSPR

$$|PR|^2 = |SP|^2 + |SR|^2$$

$$(a + (-c))^2 = 1 + a^2 + 1 + c^2$$

$$(a - c)^2 = 2 + a^2 + c^2$$

$$a^2 + c^2 - 2ac = 2 + a^2 + c^2$$

$$-2ac = 2$$

$$\underline{ac} = \frac{2}{-2} = \underline{-1}$$