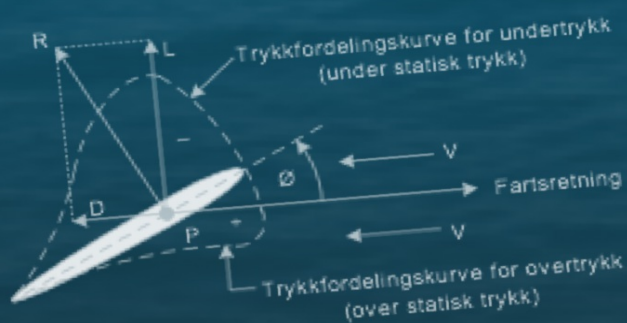


$$\frac{\tan b_{\alpha}}{\tan b_{\gamma}}$$



OPPGAVER

Oppgaver i matematikk,

Nyttig før skolestart

Tallregning og algebra

Oppgave 1 Regn ut både med og uten kalkulator

a) $3 \cdot 2 + 4$

b) $4 + 3 \cdot 2$

c) $3 \cdot (-2) + 4$

d) $4 + 3 \cdot (-2)$

e) $2 \cdot 3^2 + 4$

f) $2 \cdot (-3)^2 + 4$

g) $(-3) \cdot (-2) - 7$

h) $(-3) \cdot (-2)^3 - 7$

i) $(2)^3 - 1$

j) $(-2)^3 - 1$

k) $-2^3 - 1$

l) $-(-2)^3 - 1$

Oppgave 2 Forkort brøkene både med og uten kalkulator

a) $\frac{3}{6}$

b) $\frac{4}{24}$

c) $\frac{18}{27}$

d) $\frac{45}{165}$

e) $\frac{315}{420}$

Oppgave 3 Regn ut både med og uten kalkulator

a) $\frac{1}{6} + \frac{2}{3}$

b) $\frac{3}{4} - \frac{3}{8}$

c) $3 + \frac{5}{6}$

d) $\frac{1}{4} + \frac{2}{3}$

e) $\frac{5}{6} \cdot \frac{2}{15}$

f) $5 \cdot \frac{2}{3}$

g) $\frac{1}{12} : \frac{2}{3}$

h) $5 : \frac{2}{3}$

Oppgave 4 Regn ut både med og uten kalkulator

a) $2\left(\frac{1}{4} - \frac{3}{8}\right)$

b) $\left(\frac{3}{4} - \frac{1}{5}\right) \cdot \frac{5}{4}$

c) $\left(1 - \frac{5}{6}\right)\left(\frac{5}{6} + \frac{1}{3}\right)$

d) $\frac{\frac{1}{2}}{\frac{1}{5}}$

e) $\frac{\frac{21}{36}}{\frac{14}{45}}$

f) $\frac{\frac{1}{2} + \frac{3}{4}}{\frac{1}{5} + 3}$

g) $\frac{2 - \frac{1}{2}}{\frac{1}{5} \cdot \frac{5}{6}} + \frac{3}{5}$

Oppgave 5 Skriv enklere

a) $3a + 5a - b$

b) $3a + 4a - b + 5b - 7a$

c) $6a + 2(5a + b) - 3b$

d) $a^2 + 4b - 5a^2 - 5a + 8a^2 + b$

e) $xy + 5x - xy + x^2y - x^2$

f) $3a + 5a - b$

g) $3(ab + b) + 2(a - b)$

h) $3(ab - b) - 2(a - b)$

$$i) -(ab + b) - (a - b)$$

$$j) 3(ab + b) - (a - b) 2$$

Oppgave 6 Skriv enklere

$$a) \frac{x}{6} + \frac{x}{3}$$

$$b) \frac{3}{4a} - \frac{3}{8a}$$

$$c) \frac{3}{x} + \frac{1}{2x} + \frac{2}{3x}$$

$$d) \frac{9a}{4} \cdot \frac{2}{3a}$$

$$e) \frac{5x^2}{6y} \cdot \frac{3y^2}{15x}$$

$$f) \frac{5a}{6} : \frac{15a}{3}$$

$$g) \frac{x}{12} : 3x$$

Likninger og formler

Oppgave 7 Løs likningene

a) $2x = 18$

b) $\frac{2}{3}x = 10$

c) $3x = \frac{1}{6}$

d) $\frac{1}{4}x = \frac{3}{2}$

e) $\frac{3}{5} = \frac{3x}{2}$

f) $2x - 3 = 11$

g) $3a + 4 = a + 12$

h) $x - 3 = -3x - 7$

i) $11a = 2(5a + 1) - 3a$

j) $2(x - 4) = 3(5 - 2x)$

k) $0,01(x + 45) = 0,003(x - 30)$

Oppgave 8 Løs likningene

a) $\frac{5}{6}x + 2 = \frac{1}{3}x - \frac{1}{6}$

b) $\frac{3}{x} - 2 = \frac{5}{x}$

c) $\frac{x-1}{3} = \frac{2x+1}{4}$

d) $\frac{x-1}{3} + 1 = \frac{2x+1}{4}$

Oppgave 9 Løs med hensyn på de ukjente

a) $G = m \cdot g$

$$\begin{aligned} m &= ?, \\ g &= ? \end{aligned}$$

b) $F = k \cdot x$

$$\begin{aligned} k &= ?, \\ x &= ? \end{aligned}$$

c) $Q = s \cdot m$

$m=?$,
 $s=?$

d) $C = c \cdot m$

$m=?$,
 $c=?$

e) $W = P \cdot t$

$P=?$,
 $t=?$

f) $v = \frac{s}{t}$

$s=?$,
 $t=?$

g) $\rho = \frac{m}{V}$

$m=?$,
 $V=?$

a) $P = \frac{U^2}{R}$

$R=?$,
 $U=?$

h) $E_p = m \cdot g \cdot h$

$m=?$,
 $g=?$,
 $h=?$

i) $E_k = \frac{1}{2} \cdot m \cdot v^2$

$m=?$,
 $v=?$

j) $E_p = \frac{1}{2} \cdot k \cdot x^2$

$k=?$,
 $x=?$

k) $W = F \cdot s \cdot \cos \alpha$

$F=?$,
 $s=?$,
 $\cos \cdot \alpha = ?$

l) $\frac{p_1 \cdot V_1}{T_1} = \frac{p_2 \cdot V_2}{T_2}$

$p_1=?$,
 $V_1=?$,
 $T_1=?$,
 $p_2=?$,
 $V_2=?$,
 $T_2=?$

m) $n = \frac{P_{\text{avgitt}}}{P_{\text{tilført}}}$

$P_{\text{avgitt}}=?$,
 $P_{\text{tilført}}=?$

n) $Q = c \cdot m \cdot \Delta T$

$m=?$,
 $c=?$,
 $\Delta T=?$

o) $\overline{E_k} = \frac{3}{2} \cdot k \cdot T$

$k=?$,
 $T=?$

Oppgave 10

a) $E_{\text{total}} = E_k + E_p$

$E_k=?$,
 $E_p=?$

b) $E_{p1} + E_{k1} = E_{p2} + E_{k2}$

$$E_{p1}=?$$
$$E_{k1}=?$$
$$E_{p2}=?$$
$$E_{k2}=?$$

$$c) U = U_1 + R \cdot I$$

$$U_1=?$$
$$R=?$$
$$I=?$$

$$d) p = p_0 + \rho \cdot g \cdot h$$

$$p_0=?$$
$$\rho = ?$$
$$g = ?$$
$$h = ?$$

$$e) v = v_0 + a \cdot t$$

$$v_0=?$$
$$a=?$$
$$t=?$$

$$f) \varrho_m = cm(t_2 - t_1)$$

$$c=?$$
$$m=?$$
$$t_2=?$$
$$t_1=?$$

$$g) s = \frac{v_0 + v}{2} \cdot t$$

$$t=?$$
$$v_0=?$$
$$v=?$$

$$h) v^2 - v_0^2 = 2 \cdot a \cdot s$$

$$v=?$$
$$v_0=?$$
$$a=?$$
$$s=?$$

$$i) s = v_0 \cdot t + \frac{1}{2} \cdot a \cdot t^2$$

$$v_0 = ?,$$
$$a = ?$$

$$j) R_2 = R_1(1 + \alpha \cdot \Delta t)$$

$$R_1 = ?,$$
$$\Delta = ?,$$
$$\alpha = ?$$

$$k) R_2 = R_1(1 + \alpha \cdot (t_2 - t_1))$$

$$R_1 = ?,$$
$$t_2 = ?,$$
$$t_1 = ?$$

$$l) W = \frac{1}{2} \cdot m \cdot v^2 - \frac{1}{2} \cdot m \cdot v_0^2$$

$$v = ?,$$
$$v_0 = ?,$$
$$m = ?$$

Opgave 11

$$a) F_f = \mu \cdot F_N$$

$$\mu = ?,$$
$$F_N = ?$$

$$b) P_i = W_i \cdot n_a \cdot i$$

$$W_i = ?,$$
$$n_a = ?,$$
$$i = ?$$

$$c) n_m = \frac{P_e}{P_i}$$

$$P_e = ?,$$
$$P_i = ?$$

$$d) C_M = \frac{A_M}{B \cdot T}$$

$A_M = ?$,
 $B = ?$,
 $T = ?$

e) $F = k_1 \cdot v^2$

$k_1 = ?$,
 $v = ?$

f) $V_h = \frac{\pi D^2}{4} \cdot S$

$S = ?$,
 $D = ?$

g) $BM = \frac{C_1 \cdot B^2}{C_B \cdot T}$

$C_1 = ?$,
 $C_B = ?$,
 $T = ?$,
 $B = ?$

h) $P_t = k_i \cdot F \cdot v^3$

$k_1 = ?$,
 $F = ?$,
 $v = ?$

i) $F_p = \frac{M \cdot v^2}{R}$

$M = ?$,
 $v = ?$,
 $R = ?$

j) $S = \frac{v \cdot n}{p} \cdot \left(\frac{d}{C}\right)^2$

$v = ?$,
 $n = ?$,
 $p = ?$,
 $d = ?$,
 $C = ?$

k) $f_e = \frac{1}{2\pi} \cdot \sqrt{\frac{k}{m}}$

$$k=?,$$
$$m=?$$

$$l) T = \frac{2\pi R}{\sqrt{(g \cdot GM)}}$$

$$R=?,$$
$$GM=?$$

Opgave 12

$$a) KB = k_1 \cdot T + BM$$

$$k_1 = ?,$$
$$T = ?,$$
$$BM = ?$$

$$b) Q = k \cdot A(t_1 - t_2)$$

$$k = ?,$$
$$A = ?,$$
$$t_1 = ?,$$
$$t_2 = ?$$

$$c) KB = T - \frac{1}{3} \left(\frac{T}{2} + \frac{\nabla}{A} \right)$$

$$\nabla = ?,$$
$$A = ?,$$
$$T = ?$$

$$d) KB = \frac{T}{1+C_{pv}}$$

$$T = ?,$$
$$C_{pv} = ?$$

$$e) R = \frac{N-M}{D}$$

$$N=?,$$
$$M=?,$$
$$D=?$$

$$f) G = \frac{E}{2(1+\mu)}$$

$$E=?$$

$$g) d = 2\sqrt{h(2r - h)}$$

$$r=?$$

$$h) S = 4\pi R\sqrt{\frac{r^2 + R^2}{2}}$$

$$r=?,$$
$$R=?$$

$$i) T = 4\pi \cdot \sqrt{\frac{(M+3m)L}{3(M+2m)g}}$$

$$L=?,$$
$$M=?,$$
$$m=?$$

$$j) d = 3\sqrt{\frac{P}{Q-P}}$$

$$Q=?,$$
$$P=?$$

$$k) n_e = \frac{Q_t - Q_b}{Q_t}$$

$$Q_b = ?,$$
$$Q_t = ?$$

$$l) T - W = \frac{Wv^2}{gx}$$

$$T=?,$$
$$W=?,$$
$$v=?$$

$$m) \omega = \sqrt{\frac{1}{LC} - \frac{R^2}{4L^2}}$$

$$R=?,$$
$$C=?$$

Bruk av prefikser

Oppgave 13 Prefikser

a) Fyll ut tabellen:

| . | Forkortes til | som tierpotens | . |
|-------|---------------|----------------|-----------|
| Terra | | | |
| Giga | | | |
| | M | | |
| kilo | | | |
| milli | m | | |
| | μ | 10^{-6} | 0,000 001 |
| nano | | | |
| pico | | | |

b) Hvordan skal EXP-tasten på kalkulator brukes hvis du ønsker å skrive

$$3k = 3 \cdot 10^3 ?$$

c) Undersøk setup (shift, menu, display) for å se hvilken virkning følgende innstillinger har å si for tallet $3 \cdot 10^3$:

- 1) Norm 1
- 2) Norm1/E

Oppgave 14 Bruk kalkulator til å regne oppgavene på enklest mulig måte:

a) $154mV + 1,3V + 950uV =$

b) $3,3A + 990uA + 56mA =$

c) $R = R_1 + R_2 + R_3 = 860\Omega + 1Mk\Omega + 15k\Omega =$

d) $R = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{1k\Omega \cdot 60k\Omega}{1k\Omega + 60k\Omega} =$

e) $P = \frac{U^2}{R} = \frac{(12V)^2}{15M\Omega} =$