

Fasit til uia grimstad matte 2 bygdelen konteeksamen høst 2015

Oppgave 3 (a): Wolfram Alpha gir:

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☰ [Examples](#) ↔ [Random](#)

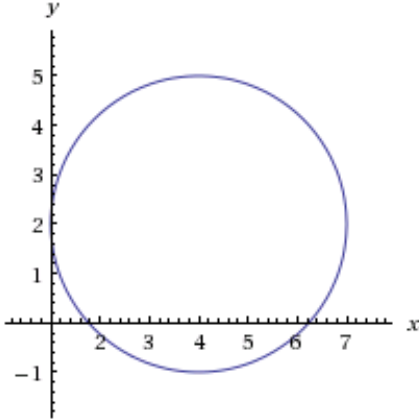
Input:

$$x^2 + y^2 - 8x - 4y = -11$$

Geometric figure: Properties

circle

Implicit plot:



🔄 [Enable interactivity](#)

Alternate forms: More

$$(x - 8)x + (y - 4)y = -11$$

$$x^2 + (y - 4)y + 11 = 8x$$

$$(x - 4)^2 + (y - 2)^2 - 9 = 0$$

Oppgave 3 (b):

The screenshot shows the GeoGebra CAS interface. On the left, the Graphics view displays a blue curve defined by the parametric equations $x = t \cos(t)$ and $y = t \sin(t)$ for $1.57 \leq t \leq 6.28$. The curve starts at approximately (-3, 0) and ends at (6, 0). The Spreadsheet view on the right contains the following data:

	A	B	C
1	t	x(t)	y(t)
2	1.57	0	1.57
3	2.09	-1.05	1.81
4	2.62	-2.27	1.31
5	3.14	-3.14	0
6	3.67	-3.17	-1.83
7	4.19	-2.09	-3.63
8	4.71	0	-4.71
9	5.24	2.62	-4.53
10	5.76	4.99	-2.88
11	6.28	6.28	0

The CAS view on the right shows the following steps:

- $f(t) := t \cos(t)$
 $\rightarrow f(t) := t \cos(t)$
- $g(t) := -t \sin(t)$
 $\rightarrow g(t) := -t \sin(t)$
- Simplify[Derivative[f(t), t]^2 + Derivative[g(t), t]^2]
 $\rightarrow t^2 + 1$

Oppgave 3 (c) (i):

```

wxMaxima 14.12.1 [unsaved*]
File Edit Cell Maxima Equations Algebra Calculus Simplify Plot Numeric Help
(%i17) load(vect);
(%o17)
C:/Program Files (x86)/Maxima-sbcl-5.35.1.2/share/maxima/5.35.1.2/share/vector/vect.mac
(%i20) p:[1,2,-8];
(%o20) [1,2,-8]
(%i27) R:sqrt(p[1]^2+p[2]^2+p[3]^2);
(%o27) sqrt(69)
(%i28) kule:[R,acos(p[3]/R),atan2(p[2],p[1])];
(%o28) [sqrt(69), pi-acos(8/sqrt(69)), atan(2)]
(%i30) float(kule), numer;
(%o30) [8.306623862918075, 2.869039779054612, 1.10714871779409]
(%i32) cylinder:[sqrt(p[1]^2+p[2]^2),atan2(p[2],p[1]),p[3]];
(%o32) [sqrt(5), atan(2), -8]
(%i33) float(cylinder), numer;
(%o33) [2.23606797749979, 1.10714871779409, -8.0]

```

Oppgave 3 (c) (ii):

```

wxMaxima 14.12.1 [maxima1.wxm*]
File Edit Cell Maxima Equations Algebra Calculus Simplify Plot Numeric Help
(%i17) load(vect);
(%o17)
C:/Program Files (x86)/Maxima-sbcl-5.35.1.2/share/maxima/5.35.1.2/share/vector/vect.mac
(%i37) r0:[1,1,0]; r1:[0,1,1]; v:[1,-1,-1];
(%o37) [1,1,0]
(%o38) [0,1,1]
(%o39) [1,-1,-1]
(%i41) t:express((r0-r1)~v);
(%o41) [-1,0,-1]
(%i45) s:sqrt(t.t)/sqrt(v.v);
(%o45) sqrt(2)/sqrt(3)
(%i46) float(s);
(%o46) 0.8164965809277261

```

