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> # Problem 3.7-5, Asmar 2nd edition
  # Some hand calculations were done before coding below.
> # B_{mn}=0 for all m,n
  # B_{mn}^* = (16/sqrt(m^2+n^2))(1/(mn))(1/pi^2) for m,n odd,
  # B_{mn} = zero otherwise
> Bstar:=(m,n)->(16/sqrt(m^2+n^2))*(1/(m*n))(1/Pi^2);
```

$$Bstar := (m, n) \rightarrow \frac{16 \left(\dfrac{1}{m\,n} \right) \left(\dfrac{1}{\pi^2} \right)}{\sqrt{m^2 + n^2}} \tag{1}$$

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> phi:=(x,y,t,m,n)->sin(m*Pi*x)*sin(n*Pi*y)*sin(sqrt(m^2+n^2)*t);
>
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$$\phi := (x, y, t, m, n) \rightarrow \sin(m\,\pi\,x)\,\sin(n\,\pi\,y)\,\sin\left(\sqrt{m^2 + n^2}\ t\right) \tag{2}$$

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> N:=20: # Number of partial sum terms is N^2=400.
>
> u:=(x,y,t)->sum(sum(Bstar(2*K+1,2*L+2)*phi(x,y,t,2*K+1,2*L+1),L=
  0..N),K=0..N);
>
```

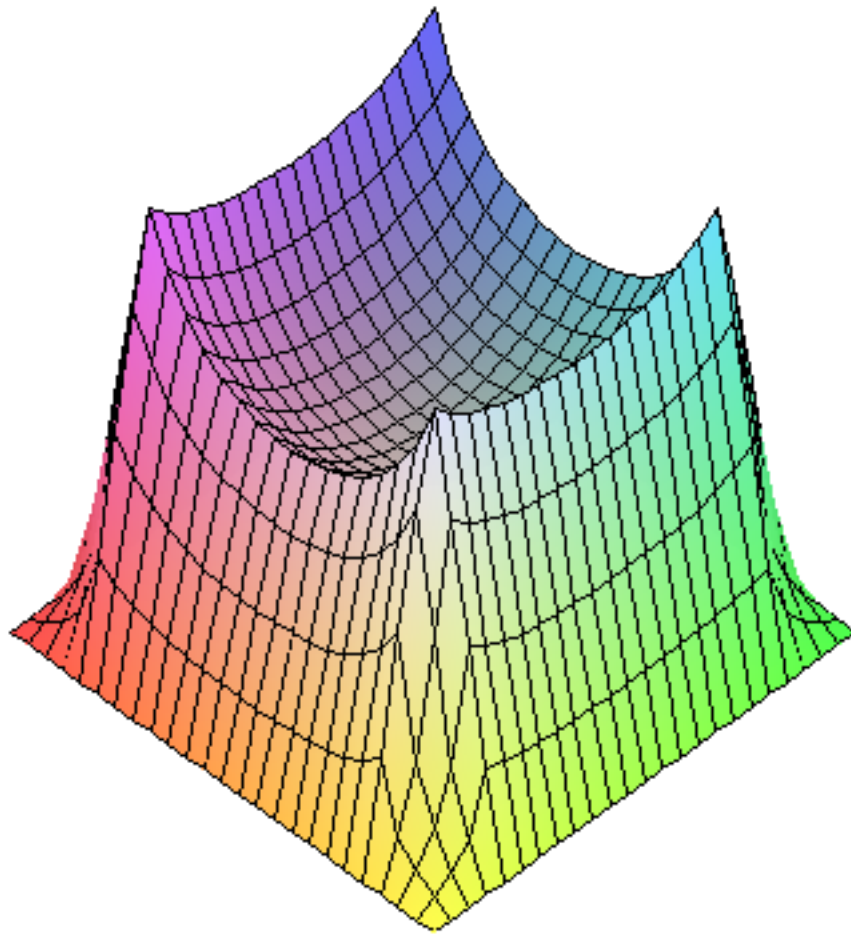$$u := (x, y, t) \rightarrow \sum_{K=0}^{N} \left(\sum_{L=0}^{N} Bstar(2\,K+1, 2\,L+2)\ \phi(x, y, t, 2\,K+1, 2\,L+1) \right) \tag{3}$$
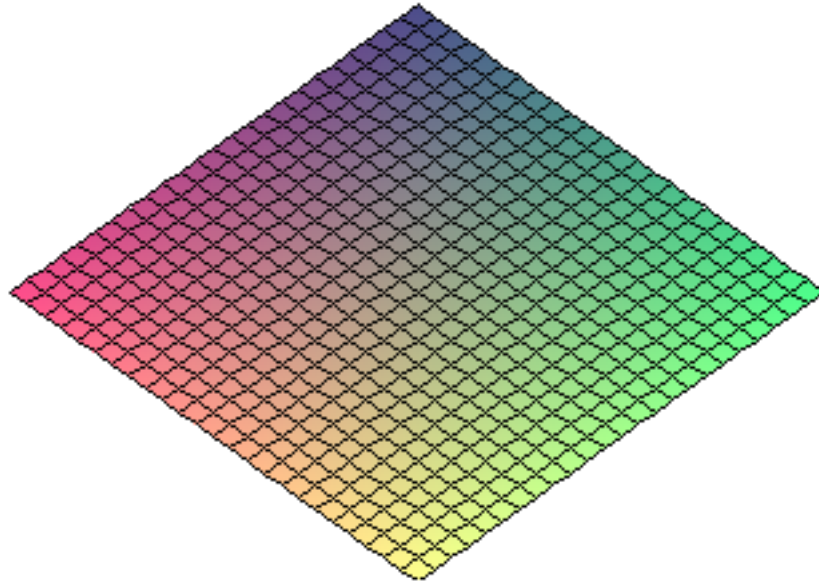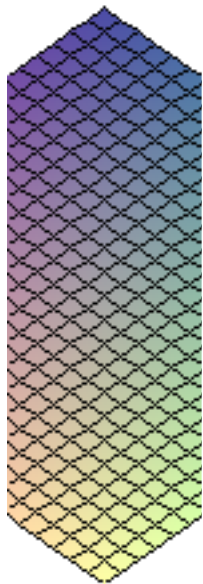
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> plot3d(u(x,y,0.5),x=0..1,y=0..1);
>
```

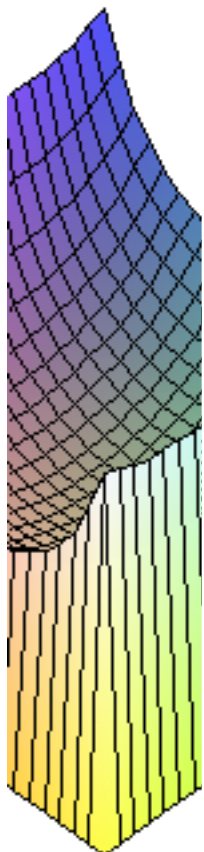> plots[animate](plot3d,[u(x,y,t),x=0..1,y=0..1],t=0..3);

$t = 0.$

$t = 0.$	t $= 0.125\backslash$ $000000\backslash$ 0	t $= 0.250\backslash$ $000000\backslash$ 0	t $= 0.375\backslash$ $000000\backslash$ 0	t $= 0.500\backslash$ $000000\backslash$ 0
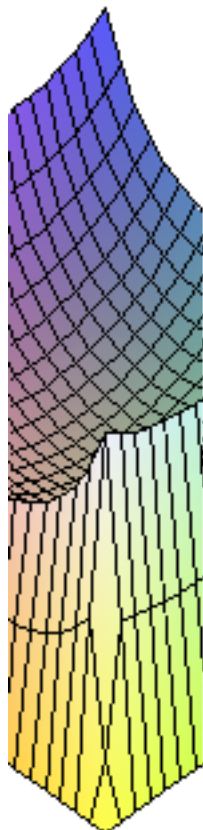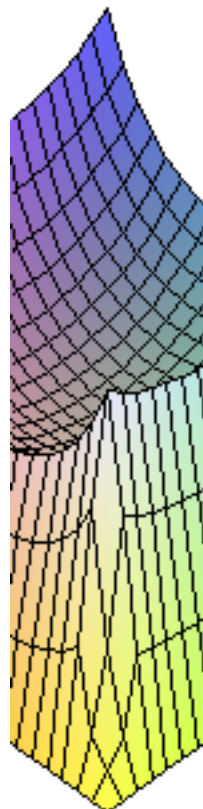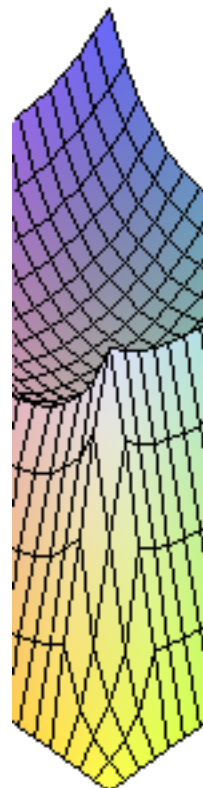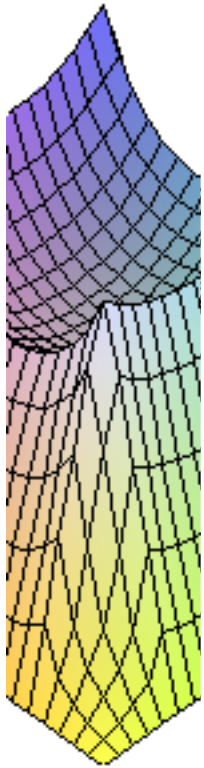
$t = 0.625\backslash$ $000000\backslash$ 0	$t = 0.750\backslash$ $000000\backslash$ 0	$t = 0.875\backslash$ $000000\backslash$ 0	$t = 1.000\backslash$ 000000	$t = 1.125\backslash$ 000000
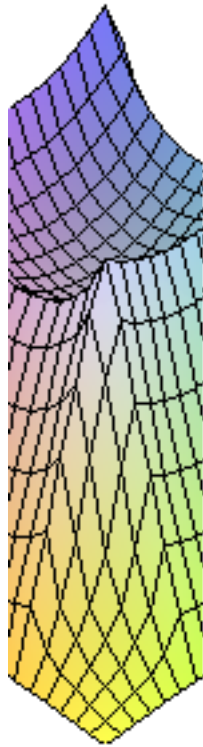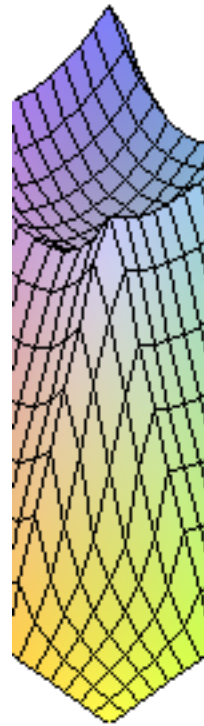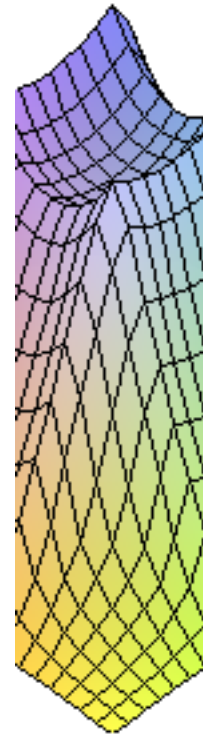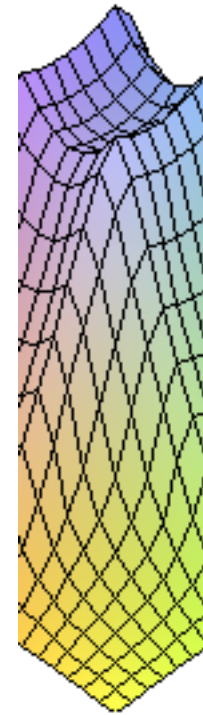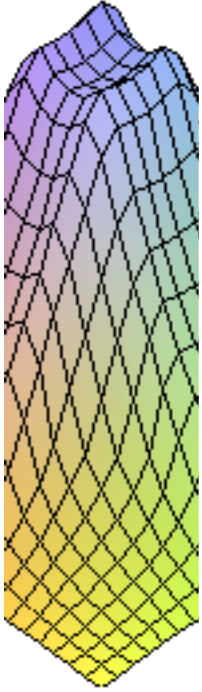
t = 1.250\000000	t = 1.375\000000	t = 1.500\000000	t = 1.625\000000	t = 1.750\000000
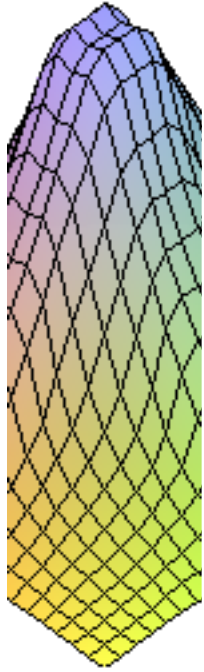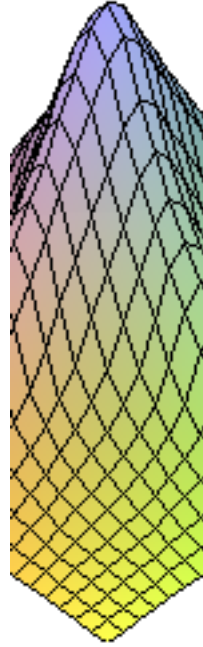
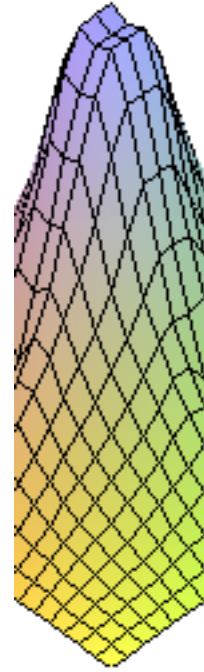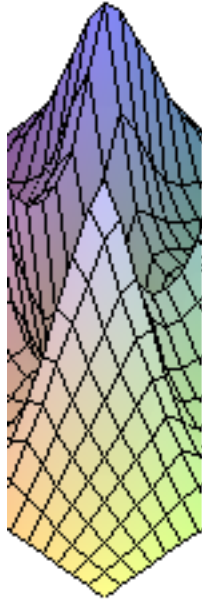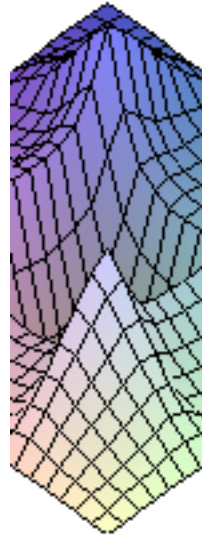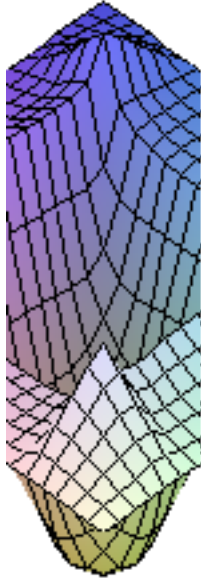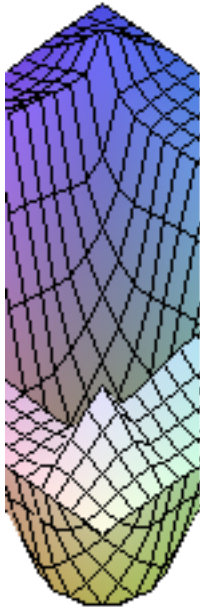| t	t	t	t	t
= 1.875\ 000000	= 2.000\ 000000	= 2.125\ 000000	= 2.250\ 000000	= 2.375\ 000000

t	t	t	t	t
$= 2.500\backslash$	$= 2.625\backslash$	$= 2.750\backslash$	$= 2.875\backslash$	$= 3.000\backslash$
000000	000000	000000	000000	000000