```python
import numpy as np
import matplotlib.pyplot as plt
```

```python
X = np.array([
    [0, 0],
    [0, 1],
    [1, 0],
    [1, 1]
])
```

```python
def g(z):
    return (z >= 0).astype(int)
```

```python
def AND(x):
    return g(20*x[0] + 20*x[1] - 30)
```

```python
def OR(x):
    return g(20*x[0] + 20*x[1] - 10)
```

```python
def NAND_NOT(x):
    return g(-20*x[0] - 20*x[1] + 10)
```

```python
def XNOR(x):
    h1 = AND(x)
    h2 = NAND_NOT(x)
    return g(20*h1 + 20*h2 - 10)
```

```python
functions = {
    "AND": AND,
    "OR": OR,
    "(¬x1 ∧ ¬x2)": NAND_NOT,
    "XNOR": XNOR
}
```

```python
fig, axes = plt.subplots(1, 4, figsize=(18,4))

xx = np.linspace(-0.2, 1.2, 400)

for ax, (name, func) in zip(axes, functions.items()):
    y = np.array([func(x) for x in X])

    for p, label in zip(X, y):
        ax.scatter(
            p[0], p[1],
            color='red' if label else 'blue',
            s=100,
            edgecolor='k'
        )
    if name == "AND":
        ax.plot(xx, 1.5 - xx, 'k--', linewidth=2)

    elif name in ["OR", "(¬x1 ∧ ¬x2)"]:
        ax.plot(xx, 0.5 - xx, 'k--', linewidth=2)

    elif name == "XNOR":
        ax.plot(xx, 0.5 - xx, 'k--', linewidth=2)
        ax.plot(xx, 1.5 - xx, 'k--', linewidth=2)


        xxg, yyg = np.meshgrid(
            np.linspace(-0.2, 1.2, 300),
```

```python
            np.linspace(-0.2, 1.2, 300)
        )

        Z = np.zeros_like(xxg)
        for i in range(xxg.shape[0]):
            for j in range(xxg.shape[1]):
                Z[i, j] = XNOR([xxg[i, j], yyg[i, j]])

        ax.contourf(
            xxg, yyg, Z,
            levels=[-0.1, 0.5, 1.1],
            alpha=0.25
        )

    ax.set_title(name, fontsize=12)
    ax.set_xlim(-0.2, 1.2)
    ax.set_ylim(-0.2, 1.2)
    ax.set_xticks([0,1])
    ax.set_yticks([0,1])
    ax.grid(True)

plt.suptitle(
    "Minh hoạ khả năng phân tách tuyến tính và phi tuyến tính",
    fontsize=14
)
plt.tight_layout()
plt.show()
```


Minh hoạ khả năng phân tách tuyến tính và phi tuyến tính