

5.7

1)  $x^2 - 3x + 2 > 0$

$(x - 1)(x - 2) > 0$

|         |  |   |                  |   |                  |   |
|---------|--|---|------------------|---|------------------|---|
| $x - 1$ |  | - | $\overset{1}{0}$ | + | $\overset{2}{0}$ | + |
| $x - 2$ |  | - | $\overset{1}{0}$ | - | $\overset{2}{0}$ | + |
| P(x)    |  | + | $\overset{1}{0}$ | - | $\overset{2}{0}$ | + |

$S = ]-\infty; 1[ \cup ]2; +\infty[$

2)  $-x^2 + 3x + 4 > 0$

$x^2 - 3x - 4 < 0$

$(x + 1)(x - 4) < 0$

|         |  |   |                   |   |                  |   |
|---------|--|---|-------------------|---|------------------|---|
| $x + 1$ |  | - | $\overset{-1}{0}$ | + | $\overset{4}{0}$ | + |
| $x - 4$ |  | - | $\overset{-1}{0}$ | - | $\overset{4}{0}$ | + |
| P(x)    |  | + | $\overset{-1}{0}$ | - | $\overset{4}{0}$ | + |

$S = ]-1; 4[$

3)  $x^2 - 10x + 40 > 0$

$\Delta = (-10)^2 - 4 \cdot 1 \cdot 40 = -60 < 0$

|                  |  |   |
|------------------|--|---|
| $x^2 - 10x + 40$ |  | + |
| P(x)             |  | + |

$S = \mathbb{R}$

4)  $4x^2 - 20x + 25 > 0$

$(2x - 5)^2 > 0$

|              |  |   |                            |   |
|--------------|--|---|----------------------------|---|
| $(2x - 5)^2$ |  | + | $\overset{\frac{5}{2}}{0}$ | + |
| P(x)         |  | + | $\overset{\frac{5}{2}}{0}$ | + |

$S = \mathbb{R} - \{\frac{5}{2}\} = ]-\infty; \frac{5}{2}[ \cup ]\frac{5}{2}; +\infty[$

5)  $x^2 - 2x \leq 0$

$x(x - 2) \leq 0$

|         |  |   |                  |   |                  |   |
|---------|--|---|------------------|---|------------------|---|
| $x$     |  | - | $\overset{0}{0}$ | + | $\overset{2}{0}$ | + |
| $x - 2$ |  | - | $\overset{0}{0}$ | - | $\overset{2}{0}$ | + |
| P(x)    |  | + | $\overset{0}{0}$ | - | $\overset{2}{0}$ | + |

$S = [0; 2]$

$$6) \ 5x^2 > 0$$

|       |  |   |   |  |   |
|-------|--|---|---|--|---|
| 5     |  | + | 0 |  | + |
| $x^2$ |  | + | 0 |  | + |
| P(x)  |  | + | 0 |  | + |

$$S = \mathbb{R} - \{0\} = ]-\infty; 0[ \cup ]0; +\infty[$$

$$7) \ 5x^2 + 8x + 4 < 0$$

$$\Delta = 8^2 - 4 \cdot 5 \cdot 4 = -16 < 0$$

|                 |  |   |
|-----------------|--|---|
| $5x^2 + 8x + 4$ |  | + |
| P(x)            |  | + |

$$S = \emptyset$$

$$8) \ 4x^2 > 16$$

$$4x^2 - 16 > 0$$

$$x^2 - 4 > 0$$

$$(x - 2)(x + 2) > 0$$

|         |  |   |    |  |   |   |  |   |  |   |
|---------|--|---|----|--|---|---|--|---|--|---|
| $x - 2$ |  | - | -2 |  | - | 0 |  | 2 |  | + |
| $x + 2$ |  | - | 0  |  | + | 0 |  | + |  | + |
| P(x)    |  | + | 0  |  | - | 0 |  | + |  | + |

$$S = ]-\infty; -2[ \cup ]2; +\infty[$$

$$9) \ (x - 2)^2 + 2x < -2$$

$$(x - 2)^2 + 2x + 2 < 0$$

$$x^2 - 4x + 4 + 2x + 2 < 0$$

$$x^2 - 2x + 6 < 0$$

$$\Delta = (-2)^2 - 4 \cdot 1 \cdot 6 = -20 < 0$$

|                |  |   |
|----------------|--|---|
| $x^2 - 2x + 6$ |  | + |
| P(x)           |  | + |

$$S = \emptyset$$