9.41

Trial and ERROR, $P = 43$, $Q = 67$

$\phi(n) = (43-1) \times (67-1) = 2772$

$65 \bmod 2772$

$2772 = 65 \times 42 + 42$

$65 = 42 \times 1 + 23$

$42 = 23 \times 1 + 19$

$23 = 19 \times 1 + 4$

$19 = 4 \times 4 + 3$

$4 = 3 \times 1 + 1$

rewrite:

$42 = 2772 - 65 \times 42$

$23 = 65 - 42 \times 1$

$19 = 42 - 23 \times 1$

$4 = 23 - 19 \times 1$

$3 = 19 - 4 \times 4$

$1 = 4 - 3 \times 1$

$42 = 2772 - 65 \times 42$

$23 = 65 - 42 \times 1$

$19 = 42 - 23 \times 1$

$4 = 28 - 19 \times 1$

$3 = 19 - 4 \times 4$

$1 = 4 - 3 \times 1$

$1 = 4 - (19 - 4 \times 4)$

$= 4 - 19 + 4 \times 4$

$= 4 \times 5 - 19$

$= (23 - 19 \times 1) \times 5 - 19$

$= 23 \times 5 - 19 \times 6$

$= 23 \times 5 - (42 - 23 \times 1) \times 6$

$= 23 \times 5 - 42 \times 6 + 23 \times 6$

$= 23 \times 11 - 42 \times 6$

~~$= 65 \times 11$~~

$= (65 - 42 \times 1) \times 11 - 42 \times 6$

$= 65 \times 11 - 42 \times 17$

$= 65 \times 11 - (2772 - 65 \times 43) \times 17$

$= 65 \times 11 - 2772 \times 17 + 65 \times 714$

$= 65 \times 725 - 2772 \times 17$

$= 65 \times (725) + 2772 \times (-17)$

$\therefore d = 725$

$\therefore PR = \{775, 2881\}$