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### Elliptic Curve Digital Signature Algorithm

Curve: P-521

Hash Algorithm: SHA-512

Message to be signed: "Example of ECDSA with P-521"

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### Signature Generation

H:

9BF0E1DEEDA31E00F925B77F7CB6B1CED7368DE1DC75BB9F94582C1CA70  
9205D32AF90025B02FA132FBEBD6CDDCD9172C0D66D8E581767A8B6F71D  
E60BE1F932

E:

9BF0E1DEEDA31E00F925B77F7CB6B1CED7368DE1DC75BB9F94582C1CA70  
9205D32AF90025B02FA132FBEBD6CDDCD9172C0D66D8E581767A8B6F71D  
E60BE1F932

K:

C91E2349EF6CA22D2DE39DD51819B6AAD922D3AECDEAB452BA172F7D63E  
370CECD70575F597C09A174BA76BED05A48E562BE0625336D16B8703147  
A6A231D6BF

K<sub>inv</sub>:

1EAB94335A7ED337BCE83C95DE95447925EDB0EE27F8E8378713E767D6D  
A570FCCFB4F13DCF57F898E77DDB540A9453E0C3D5C97AE8D2EC843590B  
CB1D349044C09

R<sub>x</sub>:

140C8EDCA57108CE3F7E7A240DDD3AD74D81E2DE62451FC1D558FDC7926  
9ADACD1C2526EEEEF32F8C0432A9D56E2B4A8A732891C37C9B96641A925  
4CCFE5DC3E2BA

R<sub>y</sub>:

CD42A03AD1EB93C532FC8A54683998FF86FEC61F85F8E15B4ACD5B69649  
8F211506D340091019900C918BD8088E0352E9742EA9E2B55983ECAA343  
E424B8113428

R:

140C8EDCA57108CE3F7E7A240DDD3AD74D81E2DE62451FC1D558FDC7926  
9ADACD1C2526EEEEF32F8C0432A9D56E2B4A8A732891C37C9B96641A925  
4CCFE5DC3E2BA

D:

100085F47B8E1B8B11B7EB33028C0B2888E304BFC98501955B45BBA1478  
DC184EEEDF09B86A5F7C21994406072787205E69A63709FE35AA93BA333  
514B24F961722

S:

D72F15229D0096376DA6651D9985BFD7C07F8D49583B545DB3EAB20E0A2  
C1E8615BD9E298455BDEB6B61378E77AF1C54EEE2CE37B2C61F5C9A8232  
951CB988B5B1

Signature

R:

140C8EDCA57108CE3F7E7A240DDD3AD74D81E2DE62451FC1D558FDC7926  
9ADACD1C2526EEEEF32F8C0432A9D56E2B4A8A732891C37C9B96641A925  
4CCFE5DC3E2BA

S:

D72F15229D0096376DA6651D9985BFD7C07F8D49583B545DB3EAB20E0A2  
C1E8615BD9E298455BDEB6B61378E77AF1C54EEE2CE37B2C61F5C9A8232  
951CB988B5B1

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Signature Verification

Q\_x:

<98E91EEF9A68452822309C52FAB453F5F117C1DA8ED796B255E9AB8F64  
10CCA16E59DF403A6BDC6CA467A37056B1E54B3005D8AC030DEC FEB68DF  
18B171885D5C4>

Q\_y:

<164350C321AECFC1CCA1BA4364C9B15656150B4B78D6A48D7D28E7F319  
85EF17BE8554376B72900712C4B83AD668327231526E313F5F092999A46  
32FD50D946BC2E>

H:

<9BF0E1DEEDA31E00F925B77F7CB6B1CED7368DE1DC75BB9F94582C1CA7  
09205D32AF90025B02FA132FBEBD6CDDCD9172C0D66D8E581767A8B6F71  
DE60BE1F932>

E:

<9BF0E1DEEDA31E00F925B77F7CB6B1CED7368DE1DC75BB9F94582C1CA7  
09205D32AF90025B02FA132FBEBD6CDDCD9172C0D66D8E581767A8B6F71  
DE60BE1F932>

Sinv:

<1509E3915CAB31E70FDB27F40F200843D71FB7FC1193F3E252DAD688F9  
40C9679148F412C555D298F4803A251B0F169027E42C294625B8B2A5FDC  
1EF1F2020DF24>

U:

<1697EEFB6BD3A6DB024254FE69FD19C80EB04B71CDD16AF72F32210609  
3F971CB08C29F6F8950F0F61E45BF65BAC39A590DCB043758C6606907F2  
16A759B4EA4BE4>

V:

<14E7FC3EE94B91E092F660253DCAF92A70306BDF A317A0AB7EFB2C8286  
944BEE5F146114F2C61950F8C8699CCE1A22FE632EA89967D33FEFCB0E7  
607B4B66D157B6>

Rprime.X:

<140C8EDCA57108CE3F7E7A240DDD3AD74D81E2DE62451FC1D558FDC792  
69ADACD1C2526EEEEF32F8C0432A9D56E2B4A8A732891C37C9B96641A92  
54CCFE5DC3E2BA>

Rprime.Y:

<CD42A03AD1EB93C532FC8A54683998FF86FEC61F85F8E15B4ACD5B6964  
98F211506D340091019900C918BD8088E0352E9742EA9E2B55983ECAA34  
3E424B8113428>

Rprime:

<140C8EDCA57108CE3F7E7A240DDD3AD74D81E2DE62451FC1D558FDC792  
69ADACD1C2526EEEEF32F8C0432A9D56E2B4A8A732891C37C9B96641A92  
54CCFE5DC3E2BA>

Verification Passed!