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CORRIGENDUM

Calculating the error in refractive error

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Since the publication of the above article, the authors have noticed that further testing of the spreadsheet calculations in the article has revealed, in a predictable and limited set of special circumstances, that the spreadsheet calculations return a recognisable error. No candidates have been incorrectly scored as a result. The error is rectified in the following code, which also simplifies the number of calculation steps required.

A	Candidate name/number	
B	Correct sphere	
C	Correct cylinder	
D	Correct axis	
E	Correct spherical equivalent	=B+(C/2)
F	Candidate sphere	
G	Candidate cylinder	
H	Candidate axis	
I	Spherical equivalent from refraction	=F+(G/2)
J	X1 calculated X vector from G and H	=G*COS(RADIANS(2*H))
K	Y1 calculated Y vector from G and H	=G*SIN(RADIANS(2*H))
L	X3 calculated X vector from C and D	=C*COS(RADIANS(2*D))
M	Y3 calculated Y vector from C and D	=C*SIN(RADIANS(2*D))
N	Resulting induced cyl axis	=IF(K=M,90,DEGREES((ATAN2((L−J),(M−K)))/2))
O	Correction for minus cyl axis result	=IF(N<0,N+180,N)
P	Calculated induced sphere	=(B−F)−0.5*(G+Q−C)
Q	Calculated induced cyl power	=(C*COS(RADIANS(2*(D−O)))−(G*COS(RADIANS(2*(H−O)))))
R	Correction for induced zero cyl axis	=IF(Q=0,0,O)

If, at this stage, a dioptric power of the error is desired, as previously described, this correcting refraction can be converted as follows:

S	Calculated induced spherical equivalent	=P+(Q/2)
T	Calculates absolute SE	=SQRT(S*S)
U	Calculated absolute cylinder power	=SQRT(Q*Q)
V	Calculates the defocus equivalent	=(T+U/2)

Unconventional results still occur with special scenarios, such as a one axis being entered as zero and the other as 180 (results in zero cylinder power at 135), and one axis 10, the other (minus) −170 (result zero cylinder power at 90). The calculated dioptric defocus equivalent would still be calculated correctly.

The authors would like to apologise for this mistake.