WolframAlpha PRO FOR STUDENTS

sqrt(a*r)*sqrt(|(|(2*(d-λ/4))|^4*(e^(i*2*k*r)))|/(4*pi*r^2)*|16*pi^2/(|(2*(d-λ/4))|^4*k^2*(e^(i*2*k*a)))|)/

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Assuming i is the imaginary unit | Use i as a variable instead

Input:

$$\left\{\sqrt{a\,r} \times \frac{\sqrt{\frac{\left|\left|2\left(d-\frac{\lambda}{4}\right)\right|^4 e^{i\times 2\,k\,r}\right|}{4\,\pi\,r^2}\left|16\times\frac{\pi^2}{\left|2\left(d-\frac{\lambda}{4}\right)\right|^4 k^2\,e^{i\times 2\,k\,a}}\right|}}{3\sqrt{\pi}\,d},\ d = 0.9,\ a = 2,\ r = 1,\ k\,r = 1\right\}$$

$|z|$ is the absolute value of z

i is the imaginary unit

Result:

$$\left\{\frac{2\sqrt{a\,r}\left|d-\frac{\lambda}{4}\right|^2\sqrt{\frac{e^{2\,\mathrm{Im}(a\,k)-2\,\mathrm{Im}(k\,r)}}{r^2}}\sqrt{\left|\frac{1}{k^2\left|d-\frac{\lambda}{4}\right|^4}\right|}}{3\,d},\ d = 0.9,\ a = 2,\ r = 1,\ k\,r = 1\right\}$$

$\mathrm{Im}(z)$ is the imaginary part of z

Substitution: Approximate form

$$\frac{2\sqrt{\frac{1}{r^2}}\sqrt{a\,r}\,e^{\mathrm{Im}(a\,k)-\mathrm{Im}(k\,r)}}{3\,d\,|k|} = \frac{20\sqrt{2}}{27}$$

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