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\begin{prooftree}
\AxiomC{$\vdash\ 0+0\approx 0$}
\AxiomC{$(0+x)\approx x\ \vdash\ (0+x)\approx x$}
\AxiomC{$\vdash\ 0+s(x)\approx s(0+x)$}
\UnaryInfC{$(0+x)\approx x\ \vdash\ 0+s(x)\approx s(0+x)$}
\BinaryInfC{$(0+x)\approx x\ \vdash\ 0+s(x)\approx s(x)$}
\UnaryInfC{$\vdash\ (0+x)\approx x\to 0+s(x)\approx s(x)$}
\UnaryInfC{$\vdash\ (\forall x)[(0+x)\approx x\to 0+s(x)\approx s(x)]$}
\BinaryInfC{$\vdash\ 0+0\approx 0\land(\forall x)[(0+x)\approx x\to 0+s(x)\approx s(x)]$}
\AxiomC{$0+0\approx 0\land(\forall x)[(0+x)\approx x\to 0+s(x)\approx s(x)]\ \vdash\ (\forall x)0+x\approx x$}
\UnaryInfC{$\vdash\ 0+0\approx 0\land(\forall x)[(0+x)\approx x\to 0+s(x)\approx s(x)]\to(\forall x)0+x\approx x$}
\BinaryInfC{$\vdash\ (\forall x)0+x\approx x$}
\UnaryInfC{$\vdash\ 0+x\approx x$}
\UnaryInfC{$\vdash\ x\approx 0+x$}
\AxiomC{$\vdash\ x+0\approx x$}
\BinaryInfC{$\vdash\ x+0\approx 0+x$}
\AxiomC{$\vdash\ x+s(y)\approx s(x+y)$}
\AxiomC{$\vdash\ s(y)+0\approx s(y)$}
\UnaryInfC{$\vdash\ s(y)\approx s(y)+0$}
\AxiomC{$\vdash\ y+0\approx y$}
\AxiomC{$\vdash\ s(y)\approx s(y)$}
\BinaryInfC{$\vdash\ s(y)\approx s(y+0)$}
\BinaryInfC{$\vdash\ s(y)+0\approx s(y+0)$}
\AxiomC{$\vdash\ s(y)+s(x)\approx s(s(y)+x)$}
\UnaryInfC{$\vdash\ s(s(y)+x)\approx s(y)+s(x)$}
\UnaryInfC{$s(y)+x\approx s(y+x)\ \vdash\ s(s(y)+x)\approx s(y)+s(x)$}
\AxiomC{$s(y)+x\approx s(y+x)\ \vdash\ s(y)+x\approx s(y+x)$}
\AxiomC{$\vdash\ y+s(x)\approx s(y+x)$}
\UnaryInfC{$\vdash\ s(y+x)\approx y+s(x)$}
\UnaryInfC{$s(y)+x\approx s(y+x)\ \vdash\ s(y+x)\approx y+s(x)$}
\AxiomC{$\vdash\ s(s(y+x))\approx s(s(y+x))$}
\UnaryInfC{$s(y)+x\approx s(y+x)\ \vdash\ s(s(y+x))\approx s(s(y+x))$}
\BinaryInfC{$s(y)+x\approx s(y+x)\ \vdash\ s(s(y+x))\approx s(y+s(x))$}
\BinaryInfC{$s(y)+x\approx s(y+x)\ \vdash\ s(s(y)+x)\approx s(y+s(x))$}
\BinaryInfC{$s(y)+x\approx s(y+x)\ \vdash\ s(y)+s(x)\approx s(y+s(x))$}
\UnaryInfC{$\vdash\ s(y)+x\approx s(y+x)\to s(y)+s(x)\approx s(y+s(x))$}
\UnaryInfC{$\vdash\ (\forall x)[s(y)+x\approx s(y+x)\to s(y)+s(x)\approx s(y+s(x))]$}
\BinaryInfC{$\vdash\ s(y)+0\approx s(y+0)\land(\forall x)[s(y)+x\approx s(y+x)\to s(y)+s(x)\approx s(y+s(x))]$}
\AxiomC{$s(y)+0\approx s(y+0)\land(\forall x)[s(y)+x\approx s(y+x)\to s(y)+s(x)\approx s(y+s(x))]\ \vdash\ (\forall x)s(y)+x\approx s(y+x)$}
\UnaryInfC{$\vdash\ s(y)+0\approx s(y+0)\land(\forall x)[s(y)+x\approx s(y+x)\to s(y)+s(x)\approx s(y+s(x))]\to(\forall x)s(y)+x\approx s(y+x)$}
\BinaryInfC{$\vdash\ s(y)+x\approx s(x+y)$}
\AxiomC{$\vdash\ s(x+y)\approx s(x+y)$}
\BinaryInfC{$\vdash\ s(x+y)\approx s(y)+x$}
\UnaryInfC{$\vdash\ s(x+y)\approx s(y)+x$}
\BinaryInfC{$\vdash\ (x+s(y))\approx(s(y)+x)$}
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\UnaryInfC{$\vdash\ (x+y)\approx(y+x)\to(x+s(y))\approx(s(y)+x)$}
\UnaryInfC{$\vdash\ (\forall y)((x+y)\approx(y+x)\to(x+s(y))\approx(s(y)+x))$}
\BinaryInfC{$\vdash\ (x+0)\approx(0+x)\land(\forall y)(x+y)\approx(y+x)$}
\AxiomC{$(x+0)\approx(0+x)\land(\forall y)((x+y)\approx(y+x)\to(x+s(y))\approx(s(y)+x))\ \vdash\ (\forall y)(x+y)\approx(y+x)$}
\UnaryInfC{$\vdash\ (x+0)\approx(0+x)\land(\forall y)((x+y)\approx(y+x)\to(x+s(y))\approx(s(y)+x))\to(\forall y)(x+y)\approx(y+x)$}
\BinaryInfC{$\vdash\ x+y\approx y+x$}
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