Let $\mathbf{AB} \in \mathbb{R}^{n\times n}$, and $\mathbf{x}, \mathbf{y} \in \mathbb{R}^n$, $\alpha \in \mathbb{R}$.

Operation	Operations	
	Full matrix	Sparse matrix (m non zero entries)
$\mathbf{x}^T\mathbf{y}$	$n(*) + n - 1(+) = 2n - 1$	$2n - 1$
$\mathbf{x}(+/-)\mathbf{y}$	n	n
$\alpha\mathbf{x}$	n	n
$\mathbf{Ax}$	$(n(*) + n - 1(+))n$ (r) $= 2n^2 - n$	$(m(*) + m - 1(+))n$ (r) $= 2mn - n$
$\mathbf{AB}$	$[(n(*) + n - 1(+))n$ (r)$]n$ (c) $= 2n^3 - n^2$	$[(m(*) + m - 1(+))n$ (r) $]m$ (c) $= 2m^2n - nm$
$\mathbf{A} \in \mathbb{R}^{m\times n} \mathbf{B} \in \mathbb{R}^{n\times p}$		
$\mathbf{AB}$	$mp(2n - 1)$	
$\mathbf{A} = \mathbf{LL}^T$	$1/3n^3$	
$\mathbf{Lx} = \mathbf{y}$	n^2	
$\mathbf{L}^T\mathbf{x} = \mathbf{y}$	n^2	

Algorithm 1 CG method, solving $\mathbf{Ax} = \mathbf{b}$.	Operations	
	Full matrix	Sparse matrix
Give an initial guess $\mathbf{x}^0$. Compute $\mathbf{r}^0 = \mathbf{b} - \mathbf{Ax}^0$ and set $\mathbf{p}^0 = \mathbf{r}^0$.	$2n^2$	$2mn$
for $k = 0, ...,$ until convergence		
$\alpha^k = \frac{(\mathbf{r}^k,\mathbf{r}^k)}{(\mathbf{Ap}^k,\mathbf{p}^k)}$	$2n^2 + 3n - 2$	$2nm + 3n - 2$
$\mathbf{x}^{k+1} = \mathbf{x}^k + \alpha^k\mathbf{p}^k$	$2n$	$2n$
$\mathbf{r}^{k+1} = \mathbf{r}^k - \alpha^k\mathbf{Ap}^k$	$2n^2 + n$	$2nm + n$
$\beta^k = \frac{(\mathbf{r}^{k+1},\mathbf{r}^{k+1})}{(\mathbf{r}^k,\mathbf{r}^k)}$	$4n - 1$	$4n - 1$
$\mathbf{p}^{k+1} = \mathbf{r}^{k+1} + \beta^k\mathbf{p}^k$	$2n$	$2n$
end		
Total each k	$4n^2 + 12n - 3$	$4nm + 12n - 3$

Algorithm 2 Incomplete Cholesky factorization IC(0)	Operations	
	Full matrix	Sparse matrix
for $j = 2, ..., n$		
1) Eliminate a_{ij} from $\mathbf{R}_j$		
Divide $\mathbf{R}_i$ by a_{ii}	$n - i$	$m - i$
Multiply $\mathbf{R}_i$ by a_{ij}	$(n - i + 1)(n - i)$	$(m - i + 1)(n - i)$
Substraction $\mathbf{R}_j - \mathbf{R}_i$	$(n - i + 1)(n - i)$	$(m - i + 1)(n - i)$
Total number of operations is	$\sum_{i=1}^{n-1}(n - i)(2n - 2i + 3)$	$\sum_{i=1}^{n-1}(n - 1)(2n - 2i + 3)$

Algorithm 2 ICCG method, solving $\mathbf{Ax} = \mathbf{b}$.	Operations	
Split preconditioner	Full matrix	Sparse matrix
Give an initial guess $\mathbf{x}^0$.		
Compute $\mathbf{r}^0 = \mathbf{b} - \mathbf{Ax}^0$.	$2n^2$	$2mn$
Compute $\hat{\mathbf{r}}^0 = \mathbf{L}^{-1}\mathbf{r}^0$.	n^2	nm
Compute $\hat{\mathbf{p}}^0 = \mathbf{L}^{-T}\hat{\mathbf{r}}^0$.	n^2	nm
for $k = 0, ...,$ until convergence		
$\alpha^k = \frac{(\mathbf{r}^k,\mathbf{r}^k)}{(\mathbf{Ap}^k,\mathbf{p}^k)}$	$2n^2 + 3n - 2$	$2nm + 3n - 2$
$\mathbf{x}^{k+1} = \mathbf{x}^k + \alpha^k\mathbf{p}^k$	$2n$	$2n$
$\mathbf{r}^{k+1} = \mathbf{r}^k - \alpha^k\mathbf{L}^{-1}\mathbf{Ap}^k$	$3n^2 + n$	$3nm + n$
$\beta^k = \frac{(\mathbf{r}^{k+1},\mathbf{r}^{k+1})}{(\mathbf{r}^k,\mathbf{r}^k)}$	$4n - 1$	$4n - 1$
$\mathbf{p}^{k+1} = \mathbf{L}^{-T}\mathbf{r}^{k+1} + \beta^k\mathbf{p}^k$	$n^2 + 2n$	$nm + 2n$
end		
Total each k	$6n^2 + 12n - 3$	$6nm + 12n - 3$

Let $\mathbf{A} \in \mathbb{R}^{n\times n}$, with m non zero entries per row.

Algorithm 3 DICCG method, solving $\mathbf{Ax} = \mathbf{b}$.	Operations	
Split preconditioner	Full matrix	Sparse matrix
Let $\mathbf{Z} \in \mathbb{R}^{n \times p}$		
$\mathbf{E} = \mathbf{Z}^T\mathbf{AZ}$	$2np(2n-1)$	$2np(2m-1)$
$\mathbf{Qx} = \mathbf{ZE}^{-1}\mathbf{Z}^T\mathbf{x}$	$n^2 + 3np - n + 2p^2 - 2p$	$n^2 + 3np - n + 2p^2 - 2p$
$\mathbf{Px} = (\mathbf{I} - \mathbf{AQ})\mathbf{x}$	$3n^2 + 3np + 2p^2 - 2p - n$	$2nm + n^2 + 3np + 2p^2 - 2p - n$

Algorithm 3 DICCG method, solving $\mathbf{Ax} = \mathbf{b}$.	Operations	
Split preconditioner	Full matrix	Sparse matrix
Give an initial guess $\mathbf{x}^0$.		
Compute $\mathbf{r}^0 = \mathbf{b} - \mathbf{Ax}^0$.	$2n^2$	$2mn$
Compute $\hat{\mathbf{r}}^0 = \mathbf{Pr}^0$.	$3n^2 + 3np + 2p^2 - 2p - n$	$2nm + n^2 + 3np + 2p^2 - 2p - n$
Compute $\mathbf{y}^0 = \mathbf{L}^{-1}\hat{\mathbf{r}}^0$.	n^2	nm
Compute $\hat{\mathbf{p}}^0 = \mathbf{L}^{-T}\mathbf{y}^0$.	n^2	nm
for $k = 0, ...,$ until convergence		
$\hat{\mathbf{w}}^0 = \mathbf{PAp}^k$.	$5n^2 + 3np + 2p^2 - 2p - 2n$	$4nm + n^2 + 3np + 2p^2 - 2p - 2n$
$\alpha^k = \frac{(\hat{\mathbf{r}}^k, \mathbf{y}^k)}{(\mathbf{p}^k, \hat{\mathbf{w}}^k)}$	$2n^2 + 3n - 2$	$2nm + 3n - 2$
$\mathbf{x}^{k+1} = \mathbf{x}^k + \alpha^k\mathbf{p}^k$	$2n$	$2n$
$\mathbf{r}^{k+1} = \mathbf{r}^k - \alpha^k\mathbf{L}^{-1}\mathbf{Ap}^k$	$3n^2 + n$	$3nm + n$
$\beta^k = \frac{(\mathbf{r}^{k+1}, \mathbf{r}^{k+1})}{(\mathbf{r}^k, \mathbf{r}^k)}$	$4n - 1$	$4n - 1$
$\mathbf{p}^{k+1} = \mathbf{L}^{-T}\mathbf{r}^{k+1} + \beta^k\mathbf{p}^k$	$n^2 + 2n$	$nm + 2n$
end		
Total each k	$11n^2 + 3np + 2p^2 - 2p + 10n - 3$	$10nm + n^2 + 3np + 2p^2 - 2p + 10n - 3$
$\mathbf{x}_{it} = \mathbf{Qb} + \mathbf{P}^T\mathbf{x}^{k+1}$	$4n^2 + 6np + 4p^2 - 4p - 2n$	$2nm + 2n^2 + 6np + 4p^2 - 4p - 2n$

Operation	Operations	
	Full matrix	Sparse matrix (m non zero entries)
$\mathbf{A} = \mathbf{U}\Sigma\mathbf{V}^T$	$\tilde{1}3n^3$	$\tilde{1}1n^3 + 2mn^2$
$\mathbf{x}(+/-)\mathbf{y}$	n	n
$\alpha\mathbf{x}$	n	n
$\mathbf{Ax}$	$(n(*) + n - 1(+))n$ (r) $= 2n^2 - n$	$(m(*) + m - 1(+))n$ (r) $= 2mn - n$
$\mathbf{AB}$	$[(n(*) + n - 1(+))n$ (r)$]n$ (c) $= 2n^3 - n^2$	$[(m(*) + m - 1(+))n$ (r) $]m$ (c) $= 2m^2n - nm$
$\mathbf{A} \in \mathbb{R}^{m \times n}\mathbf{B} \in \mathbb{R}^{n \times p}$		
$\mathbf{AB}$	$mp(2n-1)$	
$\mathbf{A} = \mathbf{LL}^T$	$1/3n^3$	
$\mathbf{Lx} = \mathbf{y}$	n^2	
$\mathbf{L}^T\mathbf{x} = \mathbf{y}$	n^2	