# Active to Retirement Calculation

[Your Name]

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| Field | Value |
|---|---|
| Scheme | [Scheme Name] |
| Version | 1.0 |
| Author | [Your Name] |
| Date | [Date] |

# 1  1. Purpose

This document specifies how to calculate an active member's pension at retirement (retiring directly from active service).

# 2  2. Member Data

Enter the member's details below. **Change these values** to test different scenarios.

```
# Member details - EDIT THESE VALUES
final_pensionable_salary = 45000.00
years_of_service = 25
years_service_pre_1997 = 10      # Service before 6 April 1997 (GMP accruing)
years_service_post_1997 = 15     # Service after 5 April 1997 (no GMP)
years_early = 0                  # Years before Normal Retirement Age
gender = "M"                     # M or F
date_of_birth = "1960-05-15"     # For reference only
```

# 3   3. Scheme Parameters

These are the scheme rules. Only change if the scheme rules are different.

```
# Scheme parameters - usually don't change these
accrual_rate = 1/60              # e.g., 1/60th, 1/80th
gmp_accrual_rate = 1/80          # Typical GMP accrual rate

# Early retirement factors (years early: factor)
erf_male =   {0: 1.000, 1: 0.940, 2: 0.882, 3: 0.826, 4: 0.772, 5: 0.720}
erf_female = {0: 1.000, 1: 0.945, 2: 0.891, 3: 0.839, 4: 0.789, 5: 0.741}

# Late retirement factors (years late: factor)
lrf = {0: 1.000, 1: 1.060, 2: 1.124, 3: 1.191, 4: 1.262, 5: 1.338}

# Commutation factor (optional tax-free cash)
commutation_factor = 12          # £12 of cash for each £1 of pension given up
```

# 4   4. Calculation

## 4.1   Step 1: Calculate Total Pension at Normal Retirement Age

Formula: `Pension = Final Salary × Accrual Rate × Years of Service`

```
pension_at_nra = final_pensionable_salary * accrual_rate * years_of_service

print(f"Final pensionable salary: £{final_pensionable_salary:,.2f}")
print(f"Accrual rate:             {accrual_rate:.4f} (1/{int(1/accrual_rate)})")
print(f"Years of service:         {years_of_service}")
print(f"")
print(f"Pension at NRA:           £{pension_at_nra:,.2f}")
```

```
Final pensionable salary: £45,000.00
Accrual rate:             0.0167 (1/60)
Years of service:         25

Pension at NRA:           £18,750.00
```

## 4.2   Step 2: Calculate GMP (Pre-1997 Service)

GMP is calculated on pre-6 April 1997 service only.

```
# GMP is typically calculated differently - this is a simplified estimate
gmp_at_retirement = final_pensionable_salary * gmp_accrual_rate * years_service_pre_1997
```

```
# Excess pension is the total minus GMP
excess_at_nra = pension_at_nra - gmp_at_retirement

print(f"Pre-1997 service:          {years_service_pre_1997} years")
print(f"GMP accrual rate:          {gmp_accrual_rate:.4f} (1/{int(1/gmp_accrual_rate)})")
print(f"")
print(f"GMP at retirement:         £{gmp_at_retirement:,.2f}")
print(f"Excess at retirement:      £{excess_at_nra:,.2f}")
```

```
Pre-1997 service:          10 years
GMP accrual rate:          0.0125 (1/80)

GMP at retirement:         £5,625.00
Excess at retirement:      £13,125.00
```

## 4.3   Step 3: Apply Early/Late Retirement Factor

If retiring early, pension is reduced. If retiring late, pension may be increased.

```
# Determine retirement factor
if years_early > 0:
    # Early retirement - apply reduction
    if gender == "M":
        retirement_factor = erf_male.get(years_early, 0.720)
    else:
        retirement_factor = erf_female.get(years_early, 0.741)
    factor_type = "Early retirement factor"
elif years_early < 0:
    # Late retirement - apply increase
    years_late = abs(years_early)
    retirement_factor = lrf.get(years_late, 1.338)
    factor_type = "Late retirement factor"
else:
    retirement_factor = 1.000
    factor_type = "At NRA (no adjustment)"

# GMP is not reduced for early retirement (simplification - check scheme rules)
gmp_final = gmp_at_retirement
excess_final = excess_at_nra * retirement_factor

print(f"Years early/late:          {years_early}")
print(f"{factor_type}: {retirement_factor:.4f}")
print(f"")
print(f"GMP (final):               £{gmp_final:,.2f}")
print(f"Excess (adjusted):         £{excess_final:,.2f}")
```

```
Years early/late:          0
At NRA (no adjustment): 1.0000

GMP (final):               £5,625.00
Excess (adjusted):         £13,125.00
```

## 4.4   Step 4: Total Pension at Retirement

```
total_pension = gmp_final + excess_final

print("="*40)
print(f"TOTAL PENSION: £{total_pension:,.2f} per year")
print("="*40)
```

```
========================================
TOTAL PENSION: £18,750.00 per year
========================================
```

## 4.5   Step 5: Optional Tax-Free Cash (Commutation)

Member can give up part of their pension for a tax-free lump sum.

```
# Maximum tax-free cash is typically 25% of total value
# Simplified calculation - actual rules are more complex
max_commutation_pension = total_pension * 0.25  # Give up 25% of pension
max_lump_sum = max_commutation_pension * commutation_factor
residual_pension = total_pension - max_commutation_pension

print(f"COMMUTATION OPTION (if taking maximum lump sum):")
print(f"")
print(f"Pension given up:          £{max_commutation_pension:,.2f}")
print(f"Commutation factor:        {commutation_factor}")
print(f"Tax-free lump sum:         £{max_lump_sum:,.2f}")
print(f"Residual pension:          £{residual_pension:,.2f} per year")
```

```
COMMUTATION OPTION (if taking maximum lump sum):

Pension given up:          £4,687.50
Commutation factor:        12
Tax-free lump sum:         £56,250.00
Residual pension:          £14,062.50 per year
```

# 5   5. Summary

Run this cell to see the full calculation summary.

```
print("CALCULATION SUMMARY")
print("="*50)
print(f"")
print(f"INPUTS:")
print(f"  Final pensionable salary: £{final_pensionable_salary:>12,.2f}")
print(f"  Total years of service:   {years_of_service:>12}")
print(f"  Pre-1997 service:         {years_service_pre_1997:>12}")
print(f"  Post-1997 service:        {years_service_post_1997:>12}")
print(f"  Years early:              {years_early:>12}")
print(f"  Gender:                   {gender:>12}")
print(f"")
print(f"CALCULATION:")
print(f"  Accrual rate:             {accrual_rate:>12.4f}")
print(f"  Pension at NRA:           £{pension_at_nra:>12,.2f}")
print(f"  GMP portion:              £{gmp_at_retirement:>12,.2f}")
```

```
print(f"  Excess portion:          £{excess_at_nra:>12,.2f}")
print(f"  Retirement factor:        {retirement_factor:>12.4f}")
print(f"")
print(f"RESULT:")
print(f"  GMP at retirement:       £{gmp_final:>12,.2f}")
print(f"  Excess at retirement:    £{excess_final:>12,.2f}")
print(f"  " + "-"*36)
print(f"  TOTAL PENSION:           £{total_pension:>12,.2f} p.a.")
print(f"")
print(f"OPTIONAL COMMUTATION:")
print(f"  Max lump sum:            £{max_lump_sum:>12,.2f}")
print(f"  Residual pension:        £{residual_pension:>12,.2f} p.a.")
print(f"")
print("="*50)
```

```
CALCULATION SUMMARY
==================================================

INPUTS:
  Final pensionable salary: £   45,000.00
  Total years of service:           25
  Pre-1997 service:                 10
  Post-1997 service:                15
  Years early:                       0
  Gender:                            M

CALCULATION:
  Accrual rate:                 0.0167
  Pension at NRA:         £   18,750.00
  GMP portion:            £    5,625.00
  Excess portion:         £   13,125.00
  Retirement factor:          1.0000

RESULT:
  GMP at retirement:      £    5,625.00
  Excess at retirement:   £   13,125.00
  ----------------------------------
  TOTAL PENSION:          £   18,750.00 p.a.

OPTIONAL COMMUTATION:
  Max lump sum:           £   56,250.00
  Residual pension:       £   14,062.50 p.a.

==================================================
```

# 6   6. Early Retirement Factor Table

| Years Early | Male | Female |
|---|---|---|
| 0 | 1.000 | 1.000 |
| 1 | 0.940 | 0.945 |
| 2 | 0.882 | 0.891 |
| 3 | 0.826 | 0.839 |

| Years Early | Male | Female |
|---|---|---|
| 4 | 0.772 | 0.789 |
| 5 | 0.720 | 0.741 |

# 7   7. Late Retirement Factor Table

| Years Late | Factor |
|---|---|
| 0 | 1.000 |
| 1 | 1.060 |
| 2 | 1.124 |
| 3 | 1.191 |
| 4 | 1.262 |
| 5 | 1.338 |

# 8   8. Edge Cases

| Scenario | How to Handle |
|---|---|
| No GMP (joined after 1997) | Set `years_service_pre_1997 = 0` |
| Normal retirement | Set `years_early = 0` |
| Late retirement | Set `years_early` to negative number (e.g., -2 for 2 years late) |
| Part-time service | Adjust `years_of_service` to FTE equivalent |
| No commutation | Ignore commutation section |

# 9   9. Sign-Off

| Role | Name | Date |
|---|---|---|
| Author | | |
| Reviewer | | |
| Approver | | |