

1. Answer each of the following questions, showing all working:

- (1) Simplify  $\frac{13z^{-3}z^2}{z^3z^{-3}}$
- (2) Simplify  $y^3x^1y^{-1}y^{-3} \div y^3 \times y^{-3}$
- (3) Solve  $x - 3 \leq -4x - 33$ , then write your answer in interval format and mark it on a real line.
- (4) Expand and simplify  $\sum_{i=-1}^5 -2iz$
- (5) Evaluate  $\sum_{k=1}^5 (-1)^k k$
- (6) Write in summation notation:  $\frac{1}{3} + \frac{1}{4} + \frac{1}{5}$
- (7) Find  $z$  if  $z = \sum_{k=3}^6 2k^3$
- (8) Find  $x$  if  $\sum_{i=-3}^{-2} -x = 8$
- (9) Find  $y$  if  $\sum_{i=4}^8 yi = 120$
- (10) Find  $z$  if  $\sum_{i=z-1}^z -4i = -52$

2. Answer each of the following questions, showing all working:

- (1) Simplify  $\frac{7x^5x^0}{x^0x^{-5}}$
- (2) Simplify  $x^3x^{-1}x^{-1} \times x^{-2}y^{-1} \div y^{-3}$
- (3) Solve  $-10x - 5 < -5x - 35$ , then write your answer in interval format and mark it on a real line.
- (4) Expand and simplify  $\sum_{i=0}^2 4iy$
- (5) Evaluate  $\sum_{i=1}^4 (-2)^i i$
- (6) Write in summation notation:  $3 + 4 + 5 + 6 + 7$
- (7) Find  $z$  if  $z = \sum_{j=-2}^0 j^0$
- (8) Find  $y$  if  $\sum_{i=-4}^0 2y = 40$
- (9) Find  $y$  if  $\sum_{i=-3}^{-2} yi = -15$
- (10) Find  $x$  if  $\sum_{i=x}^{x+2} 2i = 12$

3. Answer each of the following questions, showing all working:

- (1) Simplify  $\frac{-7x^{-2}x^2}{x^{-3}x^5}$
- (2) Simplify  $y^3y^0 \times y^{-3} \div (x^{-3}x^2y^3)$
- (3) Solve  $5x - 5 \geq 4x - 6$ , then write your answer in interval format and mark it on a real line.
- (4) Expand and simplify  $\sum_{k=3}^4 -2kx$
- (5) Evaluate  $\sum_{j=2}^6 (-1)^j j$
- (6) Write in summation notation:  $\frac{2}{5} + \frac{2}{6} + \frac{2}{7} + \frac{2}{8}$
- (7) Find  $z$  if  $z = \sum_{j=4}^6 4j^0$
- (8) Find  $z$  if  $\sum_{i=-1}^3 z = -20$
- (9) Find  $z$  if  $\sum_{i=-4}^1 zi = -27$
- (10) Find  $y$  if  $\sum_{k=y-1}^y -4k = -20$

4. Answer each of the following questions, showing all working:

- (1) Simplify  $\frac{9y^{-5}y^{-5}}{y^{-2}y^2}$
- (2) Simplify  $x^1x^{-3}x^2 \times y^3x^1 \div y^0$
- (3) Solve  $5x - 3 \geq 6x + 1$ , then write your answer in interval format and mark it on a real line.
- (4) Expand and simplify  $\sum_{k=-5}^6 ky$
- (5) Evaluate  $\sum_{j=1}^4 (-1)^j j$
- (6) Write in summation notation:  $-15 - 18 - 21 - 24 - 27$
- (7) Find  $z$  if  $z = \sum_{i=-2}^2 2i^3$
- (8) Find  $z$  if  $\sum_{i=-3}^1 3z = 0$
- (9) Find  $z$  if  $\sum_{i=0}^2 zi = -3$
- (10) Find  $y$  if  $\sum_{j=y-1}^y -4j = 4$

5. Answer each of the following questions, showing all working:

(1) Simplify  $\frac{9x^{-4}x^1}{x^1x^3}$

(2) Simplify  $y^{-1}y^1x^3y^{-1} \times y^0 \div x^{-3}$

(3) Solve  $4x < -2x + 24$ , then write your answer in interval format and mark it on a real line.

(4) Expand and simplify  $\sum_{k=-5}^{-1} 3kx$

(5) Evaluate  $\sum_{j=1}^2 (-1)^j j$

(6) Write in summation notation:  $-\frac{5}{4} - \frac{5}{5} - \frac{5}{6} - \frac{5}{7} - \frac{5}{8}$

(7) Find  $y$  if  $y = \sum_{i=-1}^1 2i^1$

(8) Find  $z$  if  $\sum_{i=-3}^2 4z = 72$

(9) Find  $z$  if  $\sum_{i=1}^2 zi = 6$

(10) Find  $y$  if  $\sum_{k=y-1}^{y+1} 2k = 18$