Class Test 4

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Answer all questions. Show your working clearly.

1. In the following equations, make c the subject of the formula.

   (a) $\frac{c}{a-2b} + 5c = \frac{1}{c}$ [2]

   (b) $d = \sqrt{\frac{cef}{2c-f}} + f$ [2]

2. Simplify the following expression.

   $\left[\frac{7}{4(p+q)} + \frac{2p+q}{p^2-q^2}\right] \times \frac{(p+q)(5q-4p)}{50p-10q}$ [3]

3. Solve the following equation.

   $\frac{4y+3}{(y+3)(2y+5)} = \frac{1}{2} - \frac{3}{2y+5}$ [3]

4. Without using a calculator, solve $\frac{4}{m+5} - \frac{3m-6}{10-3m-m^2}$ when $m = 6995$. [2]

5. Given the formula $u^2 = \frac{(2v + w)^2}{3} - 3x$,

(a) find u if $v = -\frac{9}{2}$, $w = 3$ and $x = -23$, [1]

(b) make v the subject of the formula, [1]

(c) find v if $w = -3$, $u = 6$ and $x = 4$. [2]

6. Simplify the following fractions.

(a) $\frac{4}{n-1} - \frac{11}{(n-1)^2} - \frac{8}{(n-1)^3}$ [1]

(b) $\frac{2b - 3a}{a - 3b} + 5$ [1]

7. The density of an object is given by $D = \frac{m + 3}{2r^2} + 2$, where m is its mass in grams and r is its radius in cm.

(a) Find the density when the mass, $m = 162$, and radius, $r = 2.5$. [1]

(b) Find an expression for the radius, in terms of D and m. [1]

(c) Find r if $D = 9.5$ and $m = 573.6$. [1]

8. Simplify the following fractions.

(a) $\frac{3m^2 - 75n^2}{45(3 + 4n)} \div \frac{6(m + 5n)(2m - n)}{20n^2 - 25n - 30} \times \frac{24(2m - n)^2}{2n^2 - 8}$ [2]

(b) $\frac{40pr + 30qr - 80ps - 60qs}{10pr^2 - 5qr^2 - 20prs + 10qrs}$ [2]