Class Test 3

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Answer all questions. Show your working clearly.

1. Solve the following equation.

$2a = \sqrt{\frac{1-a}{2}} - 3$ [3]

2. Simplify the following fractions.

(a) $\frac{25x^2y(1+x)(1-x)}{(3y+4)(1-2y)} \times \left[\frac{4-4x}{27y^2-48} \div \frac{10x(1-x)^2}{(3y+4)^2}\right]$ [2]

(b) $18ab^3 \times \frac{\sqrt{16a^2}}{3(2ab^2)^2}$ [1]

3. Given the formula $d = \frac{a-b}{2c} - \frac{3ac}{b}$,

(a) find d if $a = 1$, $b = 7$ and $c = -7$, [1]

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

(c) find a if $b = 6$, $c = -3$ and $d = \frac{1}{2}$. [1]

4. Given that $\frac{2}{a} = \frac{p+q}{3p}$ and $\frac{3}{b} = \frac{p+q}{pq}$, find $\frac{a^2+2b}{2a}$ in terms of p and q. [3]

5. The price of a book was \$$p$. The number of books bought was given by $x = \frac{108}{p} + \frac{45}{2p} + 3$.

(a) When the price was \$4.50, find the number of books bought. [1]

(b) Find an expression for p in terms of x. [1]

(c) Given that 13 books were bought, find the price of 1 book. [1]

6. In the following equations, make x the subject of the formula

(a) $y^2 = \frac{1}{3}\sqrt{\frac{3+4x}{3x+2y}}$ [2]

(b) $m = \frac{2x - m^2 - 1}{x+1}$ [1]

7. Simplify the following expressions.

(a) $\frac{20ab(a-2b)}{(7a-3b)(2a+b)} \div \frac{16b^2(a-2b)^2}{18a^2+9ab} - \frac{5a}{7ab-3b^2}$ [2]

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

8. Simplify the following fractions.

(a) $\frac{15x+y}{9x^2-4y^2} - \frac{12}{3x+2y}$ [1]

(b) $\frac{75ac - 25bc + 30ad - 10bd}{5ac + 2ad + 10bc + 4bd}$ [2]