



Name:

1. If $f(x) = 6x + 2$ and $g(x) = 3x^2 - 3x$, work out:

a) $3f(x) = 18x + 6$

b) $f^{-1}(x) + 2g(x) = 18x + \frac{-2x}{6} + 6$

$y = 6x + 2$
 $\frac{x-2}{6} = y$
 $18x + \frac{-2x}{6} + 6$

[5]

4. On the grid identify the region represented by:

$x < 6$, $y \leq 4$, $x + y \leq 3$

meant to be dotted

[3]

2. Factorise completely and solve:

a) $x^2 - 22x + 40 = 0$
 $(x-20)(x-2)$
 $x=20$ $x=2$

b) $4x^2 - 10x + 4 = 0$
 $(4x-2)(x-2)$
 $x=0.5$ $x=2$

[5]

5. Solve

$x + 2y = 10$
 $x^2 - y^2 = 2$

$x = 10 - 2y$
 $(10 - 2y)(10 - 2y) - y^2 = 2$
 $100 - 20y - 20y + 4y^2 - y^2 = 2$
 $3y^2 - 40y + 98 = 0$
 $a=3$ $b=-40$ $c=98$
 $\frac{40 \pm \sqrt{(-40)^2 - 4 \times 3 \times 98}}{2 \times 3}$
 $y = \frac{20 + \sqrt{106}}{3}$ $x = \frac{-10 + 2\sqrt{106}}{3}$

[5]

3. Find $f^{-1}(x)$ if

a) $f(x) = \frac{5-4x}{3x}$

$y = \frac{5-4x}{3x}$
 $y(3x) = 5-4x$
 $3xy = 5-4x$
 $3xy + 4x = 5$
 $x(3y+4) = 5$
 $x = \frac{5}{3y+4}$

[3]

6. Solve

a) $2x - 4 \leq 10$
 $2x \leq 14$
 $x \leq 7$

b) $7 - 4x < 23$
 $7 < 23 + 4x$
 $-16 < 4x$
 $-4 < x$

[3]