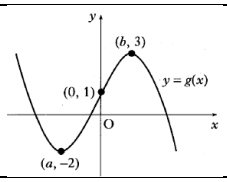
171

$f(x) = 3x - 1$ and $g(x) = \frac{1}{x+1}$

Find $f(g(x))$ and $g\big(f(x)\big)$.

State a suitable domain for $g\big(f(x)\big)$.

172 The diagram shows the graph $y = g(x)$.



a. Sketch $y = -g(x)$

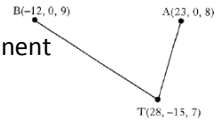
b. Sketch $y = 3 - g(x)$

173

If $\boldsymbol{f} = 3\boldsymbol{i} + 2\boldsymbol{k}$ and $\boldsymbol{g} = 2\boldsymbol{i} + 4\boldsymbol{j} + 3\boldsymbol{k}$,

Find $|\boldsymbol{f} + \boldsymbol{g}|$.

174



Express the vectors $\overrightarrow{TA}$ and $\overrightarrow{TB}$ in component form.

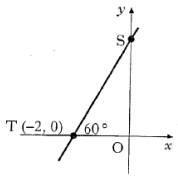
Calculate the angle between $\overrightarrow{TA}$ and $\overrightarrow{TB}$.

175 Prove the identity:

$(cosP° + sinP°)^2 = 2sinP°cosP° + 1$

176

Find the equation of the line ST, where T is the point (-2, 0) and angle STO is $60°$.



177

Triangle ABC has vertices A(-1, 12), B(-2, -5) and C(7, -2). Find the equation of the altitude AE.

178

Show that the line with equation $y = 6 - 2x$ in a tangent to the circle with equation $x^2 + y^2 + 6x - 4y - 7 = 0$ and find the coordinates of the point of contact of the tangent and the circle.

179 A sequence is defined by the recurrence relation $u_{n+1} = 0.2u_n + 5$ with $u_8 = 20$.

Calculate u_{10}.

180

Calculate the area enclosed between the curve $y = x^2 - 6x$ and the *x*-axis.