

HIGHER QUICKIES 2

If $y = \frac{x^3 - x}{x^2}$, what is $\frac{dy}{dx}$?

Functions f and g are given by $f(x) = 2x - 3$ and $g(x) = x^2$.

Find an expression for $g(f(x))$.

Find $\int \frac{1}{\sqrt[3]{x}} dx$.

A and B have coordinates $(2, 3, -2)$ and $(-1, -4, 0)$ respectively.

What is the distance between A and B?

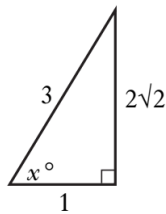
A sequence is defined by the recurrence relation

$$u_{n+1} = 3u_n - 4, u_0 = -1.$$

What is the value of u_2 ?

The diagram shows a right-angled triangle with sides of 1, $2\sqrt{2}$ and 3.

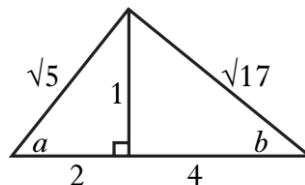
What is the value of $\sin 2x^\circ$?



$4\sqrt{2}$

a and b are angles as shown in the diagram.

What is the value of $\sin(a - b)$?



A circle has equation $x^2 + y^2 + 8x - 6y - 12 = 0$.

What is the radius of this circle?

The points $P(1, 3, 7)$, $Q(5, 13, 13)$ and $R(s, 33, 25)$ are collinear as shown in the diagram.

What is the value of s ?

SOLUTIONS

1. $1 + x^{-2}$	2. $(2x - 3)^2$	3. $\frac{3}{2}\sqrt[3]{x^2} + C$	4. $\sqrt{62}$
5. -25	6. $\frac{4\sqrt{2}}{9}$	7. $\frac{2}{\sqrt{85}}$	8. 6 units
9. 13			