

Name: _____

Student Number: _____

Marks: _____/50

[2] 1. Find the distance between the points $(-2, 1)$ and $(4, 5)$. (Give a simplified exact answer.)

[2] 2. Reduce the radical expression:

$$\sqrt[3]{32x^5y^{10}}$$

[2] 3. Rationalize the denominator and simplify:

$$\frac{2}{\sqrt{5}-1}$$

[2] 4. State the domain of $f(x) = \frac{\sqrt{9-x}}{\sqrt{x-4}}$.

[3] **5.** Solve: $\sqrt{x+16} - \sqrt{x-5} = 3$

[2] **6.** Simplify: $\frac{\sqrt[3]{x^2}\sqrt{y^3}}{\sqrt[6]{xy^5}}$

- [2] **7.** If \$5,000 is invested at 6% interest compounded monthly, what is the value after 9 years?
(Round your answer to the nearest cent.)

- [1] **8.** Use a calculator to evaluate $\log_6(1000)$ accurate to four decimal places.

- [3] **9.** Express as a single logarithm:

$$3\log(2) - \log(x) - \frac{1}{2}\log(x+1)$$

- [3] **10.** Express in terms of the simplest possible logarithms:

$$\ln\left(\frac{x^4 e^x}{\sqrt[3]{x+2}}\right)$$

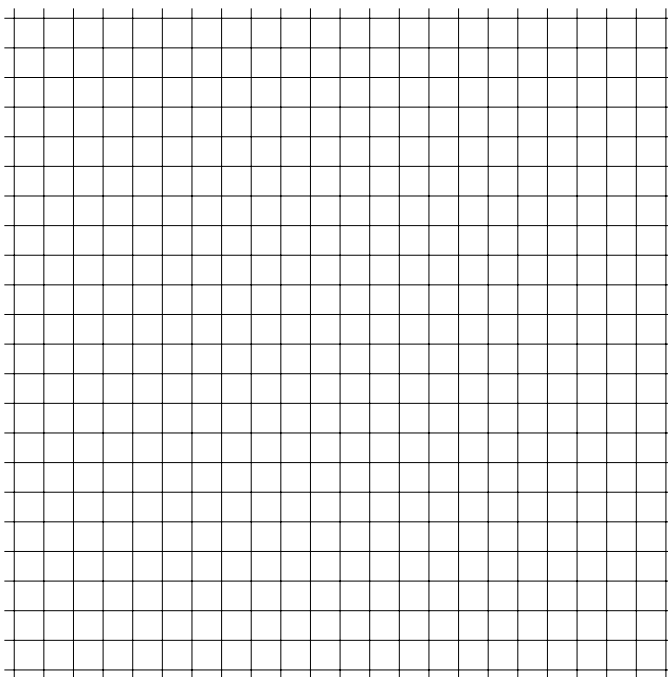
11. Solve for x :

[3] (a) $\log_2(x - 2) = 3 - \log_2(x)$

[3] (b) $125^{-3x} = \left(\frac{1}{5}\right)^{x-2}$. (Give an exact answer that does not contain logarithms.)

[4] **12.** For the function $f(x) = 1 - \log_3(x + 9)$

- (a) Find all intercepts.
- (b) Find all asymptotes.
- (c) Sketch a graph.



[2] **13.** The terminal side of an angle θ in standard position contains the point $(-3, -2)$. Find all six trig functions of θ .
(Give exact values.)

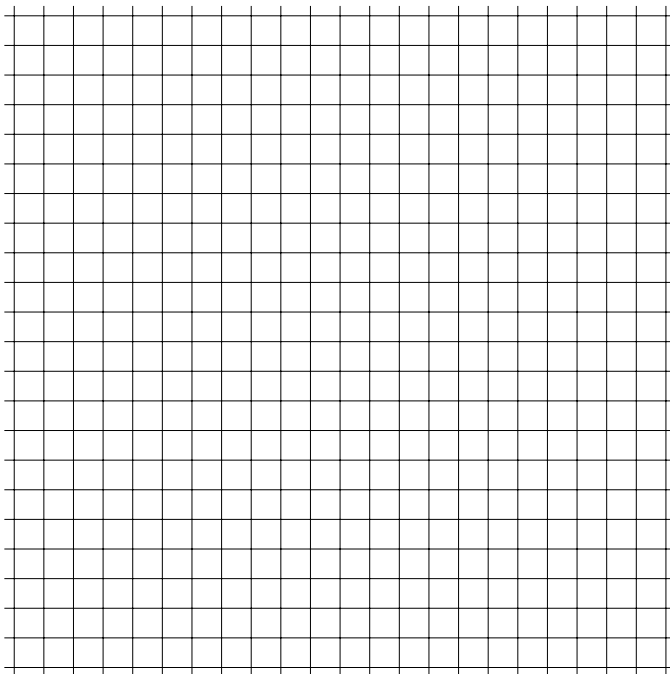
[2] **14.** Find all θ in the interval $[0^\circ, 360^\circ)$ that satisfy the equation: $\cot \theta = 5$. (Give two decimal places.)

[1] **15.** Evaluate $\cos(7\pi/6)$. (Give an exact value.)

[2] **16.** Find all θ in $[0, 2\pi)$ such that $\sec \theta = -\sqrt{2}$.

[3] **17.** For the function $f(x) = -5 \sin(x/4)$

- (a) State the amplitude A .
- (b) State the period P .
- (c) Sketch a graph. (At least two cycles.)



[4] **18.** You observe that the top of a mountain is at an angle of elevation 40° . After walking 50m towards the mountain, the angle of elevation is 44° . How high is the mountain? (Answer to the nearest metre.)

19. Prove the identities:

[2] (a) $\frac{\sec x}{\csc x} = \tan x$

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