

1. Which of these does NOT have the same value as the others?

A. $\log_2 8$

B. $\log_3 9$

C. $\log_4 64$

D. $\log_5 125$

2. Which function represents exponential growth?

A. $y = 2.5x^{1.3}$

B. $y = -2.5x^{1.3}$

C. $y = 2.5(1.3)^x$

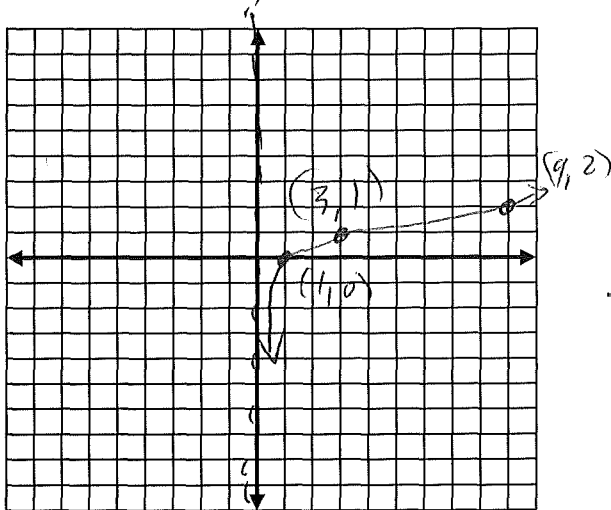
D. $y = 2.5(0.3)^x$

Sketch each graph. Label 3 points and the asymptote. Also name the domain & range.

3. $f(x) = \log_3 x$

domain: $(0, \infty)$

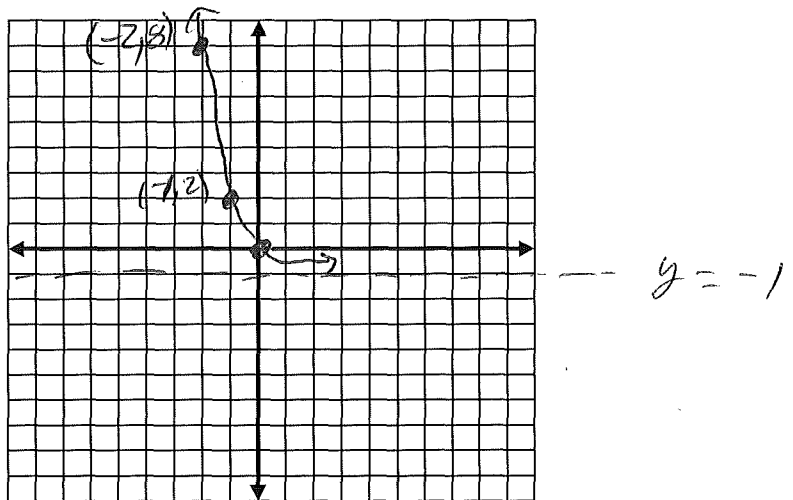
range: $(-\infty, \infty)$



4. $g(x) = \left(\frac{1}{3}\right)^x - 1$

domain: $(-\infty, \infty)$

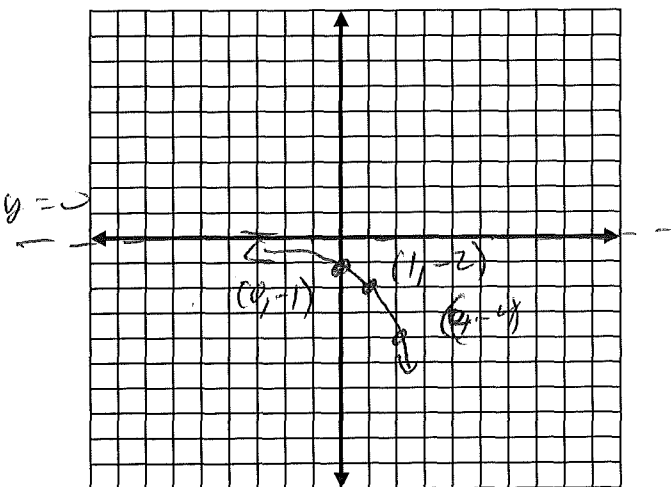
range: $(-1, \infty)$



5. $h(x) = -\frac{1}{2} \cdot 2^{x+1}$

domain: $(-\infty, \infty)$

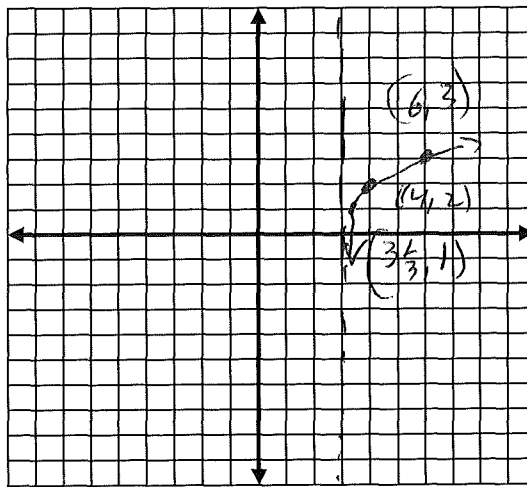
range: $(-\infty, 0)$



6. $g(x) = \log_3(x-3) + 2$

domain: $(3, \infty)$

range: $(-\infty, \infty)$



Factor Completely

7. $27x^3 - 64$

8. $375 + 24y^3$

9. An angle drawn in standard position has a terminal side that passes through the point $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$. What is the measure of the angle $[3\pi, 5\pi)$?

10. An angle of -585° is in standard position. What are the coordinates of the point at which the terminal side intersects the unit circle?

11. What is the exact value of $\sec \frac{-2\pi}{3}$?

12. Describe the translations from the parent function $y = \cos \theta$ to the new function: $y = 3 \cos(4\theta - 2) + 5$

For problems #13-15, Graph $[0, 2\pi]$:

13. $y = -3 \sin\left(\theta - \frac{\pi}{3}\right) + 1$

14. $f(x) = \tan(3\theta)$

15. $f(x) = \csc(2\theta) - 1$

16. Evaluate $5 \log_9 \sqrt{3}$

17. Use the equation of the exponential function whose graph passes through the points (2, 2) and (4, 50) to find the value of y when $x = -2$.

18. Use $\log_x 2 \approx 0.4317$ and $\log_x 3 \approx 0.6846$ to evaluate the value of $\log_x 24$.

19. Suppose you deposit \$31000 in an account paying 3.7% annual interest **compounded continuously**. How much do you have after 7 years, presuming no additional deposits or withdrawals.

20. Solve $\ln(x+2) = 3$

$$(7) 27x^3 - 64$$

$$(8) 375 + 24y^3$$

$$(3x-4)(9x^2 + 12x + 16)$$

$$3(5+2y)(25+10y+4y^2)$$

$$(9) \frac{23\pi}{6}$$

$$(10) \left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$$

$$(11) -\frac{1}{2}$$

$$(12) \text{ AMPLITUDE: } 3$$
$$\text{ RIGHT: } \frac{1}{2}$$
$$\text{ YPI: } 5$$

$$(13) (14) (15)$$

SEE GRAPHS

$$(16) 5 \log_9 \sqrt{3} = x$$

$$\log_9 3^{\frac{5}{2}} = x$$

$$9^x = 3^{\frac{5}{2}}$$

$$3^{2x} = 3^{\frac{5}{2}}$$

$$2x = \frac{5}{2}$$

$$x = \frac{5}{4}$$

$$(17) y = \frac{2}{25} \cdot 5^x$$

$$(18) \log_x 24 = \log_x (2^3 \cdot 3)$$

$$3 \log_x 2 + \log_x 3$$

$$3(0.4317) + (0.6846)$$

$$1.9797$$

$$(19) A = (31000) e^{(0.037)(7)}$$

$$= \$40,164.65$$

$$(20) \ln(x+2) = 3$$

$$e^3 = x+2$$

$$18.09 = x$$

$$\textcircled{21} \quad \frac{\sec^2 x}{\cot x} - \tan^3 x = \tan x$$

$$\tan x \sec^2 x - \tan^3 x$$

$$\tan x (\sec^2 x - \tan^2 x)$$

$$\tan x (1)$$

$$\tan x$$

$$\textcircled{22} \quad \frac{(1+\sin x)}{(1+\sin x)} \frac{1+\sin x}{1-\sin x} - \frac{1-\sin x}{1+\sin x} \frac{(1-\sin x)}{(1-\sin x)} = 4 \tan x \sec x$$

$$\frac{(1+2\sin x + \sin^2 x) - (1-2\sin x + \sin^2 x)}{1-\sin^2 x}$$

$$\frac{1+2\sin x + \sin^2 x - 1 + 2\sin x - \sin^2 x}{\cos^2 x}$$

$$\frac{4\sin x}{\cos^2 x}$$

$$4 \tan x \sec x$$

$$\textcircled{23} \quad \frac{(1+\sin x)}{(1+\sin x)} \frac{1+\sin x}{1-\sin x} = 2 \sec^2 x + 2 \sec x \tan x - 1$$

$$\frac{1+2\sin x + \sin^2 x}{1-\sin^2 x}$$

$$\frac{1+2\sin x + \sin^2 x}{\cos^2 x}$$

$$\frac{1+2\sin x + 1 - \cos^2 x}{\cos^2 x}$$

$$2 \sec^2 x + 2 \sec x \tan x - 1$$

24

$$\sin \theta + \cos \theta + \tan \theta \sin \theta = \sec \theta + \cos \theta \tan \theta$$

$$\frac{\sin \theta}{1} \frac{\cos \theta}{\cos \theta} + \frac{\cos \theta}{1} \frac{\cos \theta}{\cos \theta} + \frac{\sin \theta}{\cos \theta} \frac{\sin \theta}{1}$$

$$\cos \theta \tan \theta + \frac{\cos^2 \theta + \sin^2 \theta}{\cos \theta}$$

$$\cos \theta \tan \theta + \frac{1}{\cos \theta}$$

$$\cos \theta \tan \theta + \sec \theta$$

25

$$\frac{\tan^2 x + 5 \tan x + 6}{\sec^2 x - 10} = \frac{\tan x + 2}{\tan x - 3}$$

$$\frac{(\tan x + 3)(\tan x + 2)}{\tan^2 x + 1 - 10}$$

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

$$\frac{\tan x + 2}{\tan x - 3}$$

26

$$(1 + \sin^2 x)^2 = \cos^4 x + 4 \sin^2 x$$

$$1 + 2 \sin^2 x + \sin^4 x$$

$$1 + 2 \sin^2 x + (1 - \cos^2 x)^2$$

$$1 + 2 \sin^2 x + 1 - 2 \cos^2 x + \cos^4 x$$

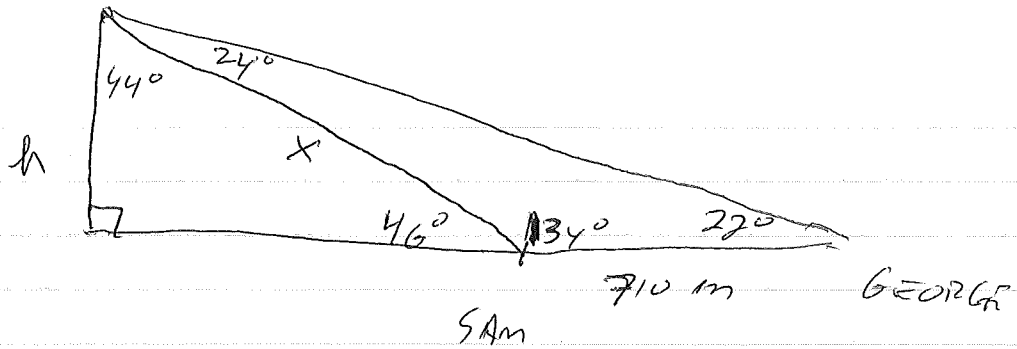
$$2 \sin^2 x + 2 - 2 \cos^2 x + \cos^4 x$$

$$2 \sin^2 x + 2(1 - \cos^2 x) + \cos^4 x$$

$$2 \sin^2 x + 2 \sin^2 x + \cos^4 x$$

$$4 \sin^2 x + \cos^4 x$$

27



$$\frac{710}{\sin 24^\circ} = \frac{x}{\sin 22^\circ}$$

$$653.9 = x$$

$$\sin 46^\circ = \frac{h}{653.9}$$

$$h = 470.4 \text{ m}$$

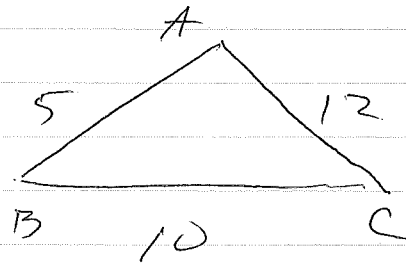
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(a)

$$\cos A = \frac{5^2 + 12^2 - 10^2}{2(5)(12)}$$

$$\cos A = \frac{25 + 144 - 100}{120}$$

$$A = 54.9^\circ$$



$$\frac{\sin 54.9^\circ}{10} = \frac{\sin B}{12}$$

$$79^\circ = B$$

$$C = 180 - 54.9 - 79 = 46.1^\circ$$

(b)

$$s = \frac{5 + 10 + 12}{2} = 13.5$$

$$A = \sqrt{13.5(13.5 - 5)(13.5 - 10)(13.5 - 12)}$$

$$= 24.5 \text{ units}^2$$

(c)

$$A = \frac{1}{2}(5)(12)\sin 54.9^\circ$$

$$= 24.5 \text{ units}^2$$

$$\textcircled{29} \quad \frac{x}{\sin 25^\circ} = \frac{17}{\sin 137^\circ}$$

$$\textcircled{x = 10,5}$$

$$\textcircled{30} \quad \cos \theta = \frac{5^2 + 10^2 - 12^2}{2(5)(10)}$$
$$= \frac{25 + 100 - 144}{2(5)(10)}$$

$$\textcircled{\theta = 100^\circ}$$

$\textcircled{31}$

$$645000 = 215000 \left(1 + \frac{0,042}{4}\right)^{4x}$$

$$\log 3 = 4x \log 1,0105$$

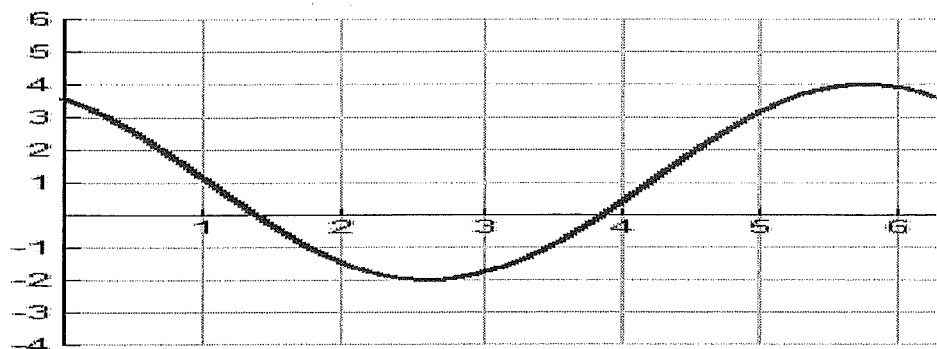
$$\log 3 = 4x \log 1,0105$$

$$\frac{\log 3}{\log 1,0105} = 4x$$

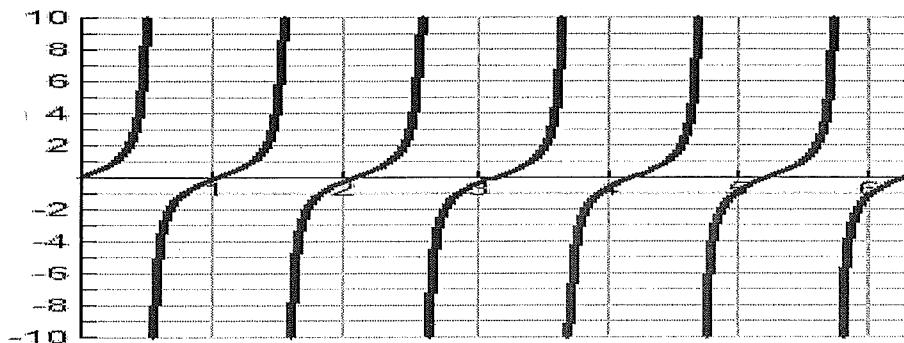
$$26,2945 = x$$

$\textcircled{26 \text{ YEARS } 3 \text{ MONTHS } 8 \text{ DAYS}}$

13. $y = -3\sin\left(\theta - \frac{\pi}{3}\right) + 1$



14. $f(x) = \tan(3\theta)$



15. $f(x) = \csc(2\theta) - 1$

