

PUT ANSWERS IN BOXES. NO BOOKS/NOTES/CALCULATORS. DO YOUR OWN WORK.
Simplify answers where possible. Include units where needed. All angles are in radians. $\log = \log_{10}$.

1. Simplify by combining using a common denominator:

$$\frac{x}{x^2-4} + \left(\frac{1}{x-2}\right)\left(\frac{x+2}{x+2}\right) = \frac{x+x+2}{(x-2)(x+2)}$$

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

2. Simplify by combining using a common denominator:

$$\left(\frac{t+6}{t+6}\right)\left(\frac{t}{t-4}\right) - \left(\frac{3}{t+6}\right)\left(\frac{t-4}{t-4}\right) = \frac{t^2+6t-(3t-12)}{(t+6)(t-4)}$$

$$\frac{t^2+3t+12}{(t+6)(t-4)}$$

3. Solve for t:

$$t+3=2t \quad t\left(1+\frac{3}{t}\right)=(2)t$$

$$3=t \checkmark$$

$$= \frac{t^2+3t+12}{(t+6)(t-4)}$$

$$t=3$$

4. Solve for x:

$$10x\left(\frac{1}{5} + \frac{3}{2x}\right) = \left(\frac{17}{10x}\right)10x$$

$$2x+15=17 \quad 2x=2 \quad x=1 \checkmark$$

$$x=1$$

5. Solve for x:

$$4x+7 \leq 19$$

$$4x \leq 12$$

$$x \leq 3$$

$$x \leq 3$$

$$\text{or } (-\infty, 3]$$

6. Find the equation of the line through the point
- $(-1, 2)$
- and parallel to the line
- $x-2y=6$
- in slope-intercept form.

$$x-2y=6 \quad y=\frac{1}{2}x-3 \quad y-2=\frac{1}{2}(x+1)$$

$$x-6=2y \quad \text{slope } \frac{1}{2} \quad y=\frac{1}{2}x+\frac{5}{2}$$

$$y=\frac{1}{2}x+\frac{5}{2}$$

7. Factor:
- $x^2+2x-15$

$$(x+5)(x-3)$$

$$(x+5)(x-3)$$

8. Find the value of:

$$\cos(0)$$

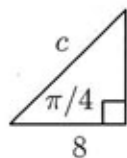
$$1$$

9. Find the value of:

$$\cos\left(\frac{\pi}{6}\right) \quad \frac{\pi}{6} = 30^\circ$$

$$\frac{\sqrt{3}}{2}$$

10. Find the value of c:



$$\cos \frac{\pi}{4} = \frac{8}{c}$$

$$\frac{\sqrt{2}}{2} = \frac{8}{c}$$

$$\sqrt{2}c = 16$$

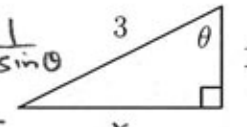
$$c = \frac{16}{\sqrt{2}} = 8\sqrt{2}$$

$$c=8\sqrt{2}$$

11. Find the value of
- $\csc(\theta)$
- :

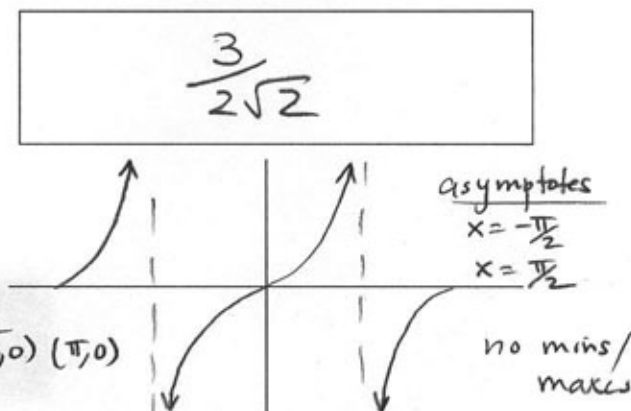
$$1^2 + x^2 = 3^2 \quad \csc(\theta) = \frac{1}{\sin \theta}$$

$$x^2 = 8 \quad = \frac{3}{\sqrt{8}}$$

$$x = \sqrt{8}$$


12. Graph the function
- $y = \tan(x)$
- for
- $-\pi \leq x \leq \pi$
- .
-
- Label with the following values (if applicable): each intercept, location of each asymptote, and
- (x, y)
- coordinates of each min and max.

intercepts
 $(-\pi, 0)$ $(0, 0)$ $(\pi, 0)$



13. Simplify:

$$\frac{10^7}{10^4} = 10^3$$

14. Simplify:

$$\left(\frac{25}{64}\right)^{3/2} \left(2\sqrt{\frac{25}{64}}\right)^3 = \left(\frac{5}{8}\right)^3$$

15. Solve for
- x
- (write answer as a rational number):

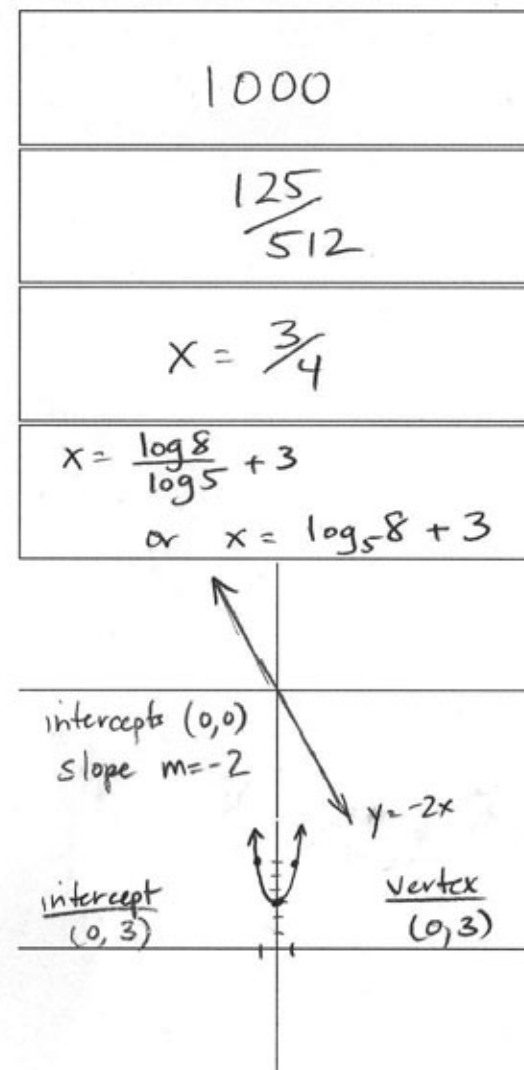
$$9^{2x-1} = 3 \quad (3^2)^{2x-1} = 3^1$$

16. Solve for
- x
- :

$$\log 5^{(x-3)} = \log 8 \quad 5^{x-3} = 8$$

$$(x-3)\log 5 = \log 8 \quad x-3 = \frac{\log 8}{\log 5}$$

17. Graph the function
- $y = -2x$
- .

Label with the following values (if applicable): each intercept, slope, and (x, y) coordinates of vertex.

18. Graph the function
- $y = 3 + 3x^2$
- .

Label with the following values (if applicable): each intercept, slope, and (x, y) coordinates of vertex.

19. Find the circumference of a circle which has radius 1 meter.

$$C = 2\pi r = 2\pi(1)$$

20. Find the volume of a sphere of radius 1 meter.

$$V = \frac{4}{3}\pi r^3$$

$$= \frac{4}{3}\pi(1)^3$$

$$\frac{3}{2\sqrt{2}}$$

$$1000$$

$$\frac{125}{512}$$

$$x = \frac{3}{4}$$

$$x = \frac{\log 8}{\log 5} + 3$$

$$\text{or } x = \log_5 8 + 3$$

$$2\pi \text{ m}$$

$$\frac{4\pi}{3} \text{ m}^3$$