

NO CALCULATORS ALLOWED.

Simplify.

1. $\frac{2}{5 - \sqrt{3}}$

2. $\frac{x^2 y^3 - x^{1/2} y^{-3} + 1}{x^5 y^{-2}}$

3. $\frac{x^3 + 3x^2 - 4}{x^2 + x - 2}$ Hint: $(x - 1)$ is a factor of both

Solve for x .

4. $\ln\left(\frac{3}{x}\right) = \ln(6x + 2) + \ln\left(\frac{1}{2}\right)$

5. $5x^4 - 4x^2 + 20 = 3x^4 + x^2 + 16$

6. Solve for x . $\sqrt{3} \cos x = \sin x$

7. Complete the table.

| θ | $\sin \theta$ | $\cos \theta$ | $\tan \theta$ |
|----------|---------------|---------------|---------------|
| $\pi/6$ | | | $\sqrt{3}/3$ |
| $\pi/4$ | $\sqrt{2}/2$ | | |
| $\pi/3$ | | $1/2$ | |
| $\pi/2$ | 1 | | |
| π | 0 | | |
| $3\pi/2$ | | 0 | |

8. Find the distance and midpoint of the line connecting the points $(4,3)$ and $(0,1)$.

9. Is the triangle with side lengths 17, 8, and 15 a right triangle?

10. Find the inverse of $g(x) = \frac{-3x-4}{x-2}$.