

III. Simplifying Radical Expressions

Completely simplify the expression below. All denominators should be rationalized.

1. $\sqrt{72}$

2. $\sqrt{150}$

3. $(\sqrt{6})(\sqrt{3})$

4. $\sqrt{3200}$

5. $(\sqrt{14})(\sqrt{21})$

6. $\sqrt{\frac{1}{4}}$

7. $(2\sqrt{6})(3\sqrt{15})$

8. $\frac{4}{\sqrt{6}}$

9. $3\sqrt{200} + 2\sqrt{8}$

10. $\frac{\sqrt{12}}{\sqrt{3}}$

11. $\frac{6 + \sqrt{3}}{5 - \sqrt{3}}$

12. $\left(\frac{3\sqrt{8}}{\sqrt{5}}\right)\left(\frac{\sqrt{60}}{\sqrt{10}}\right)$

13. $\frac{5\sqrt{6}}{3 + \sqrt{8}}$

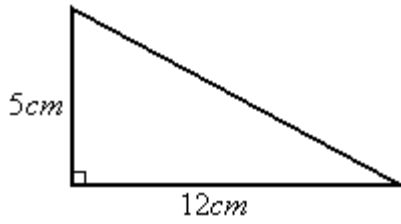
14. $\frac{4 + \sqrt{7}}{\sqrt{20}}$

15. $5\sqrt[3]{10} - 4\sqrt[3]{270}$

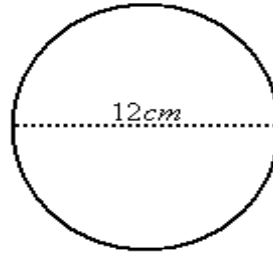
IV. Area and Perimeter/Circumference

Find the area and perimeter (or circumference in # 2) of each figure below.

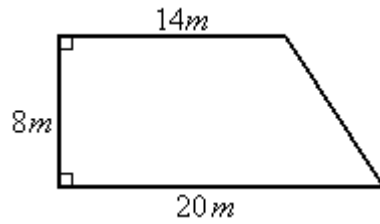
1. The figure is a triangle



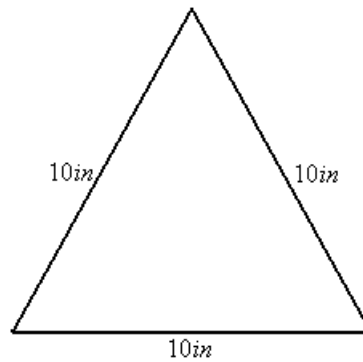
2. The figure is a circle



3. The figure is a trapezoid



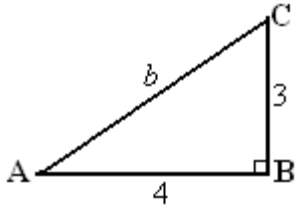
4. The figure is a triangle



V. Trigonometric Ratios

Find the unknown side. Then find the trigonometric ratios. Simplify all radicals and rationalize all denominators.

1.



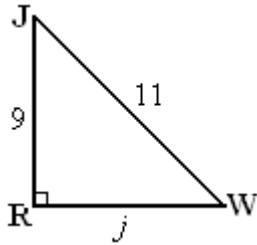
$$\sin A =$$

$$\sin C =$$

$$\cos A =$$

$$\cos C =$$

2.



$$\sin J =$$

$$\sin W =$$

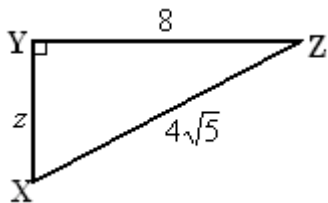
$$\cos J =$$

$$\cos W =$$

$$\tan J =$$

$$\tan W =$$

3.



$$\sin X =$$

$$\sin Z =$$

$$\cos X =$$

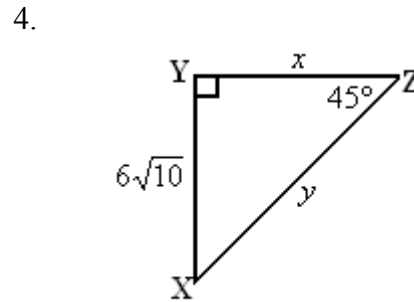
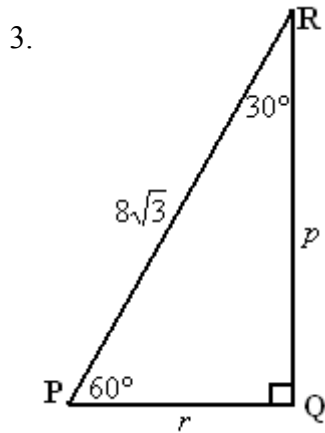
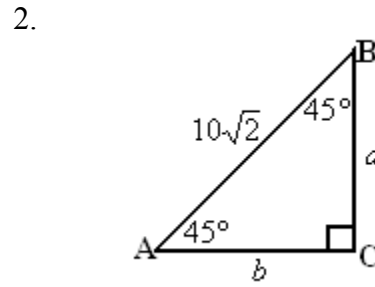
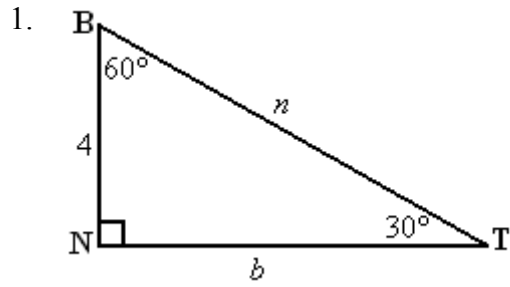
$$\cos Z =$$

$$\tan X =$$

$$\tan Z =$$

VI. Special Right Triangles

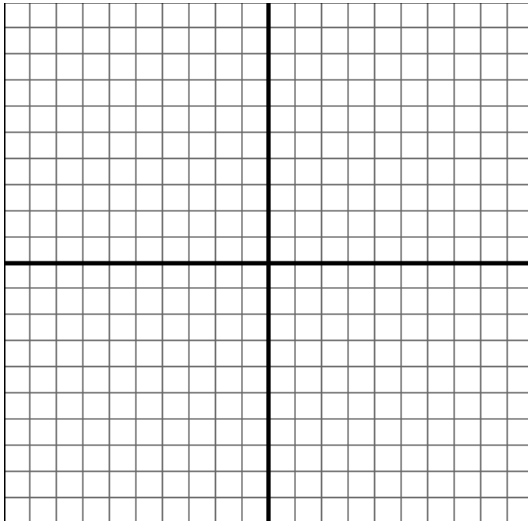
Find the exact length of the unknown sides in each triangle below.



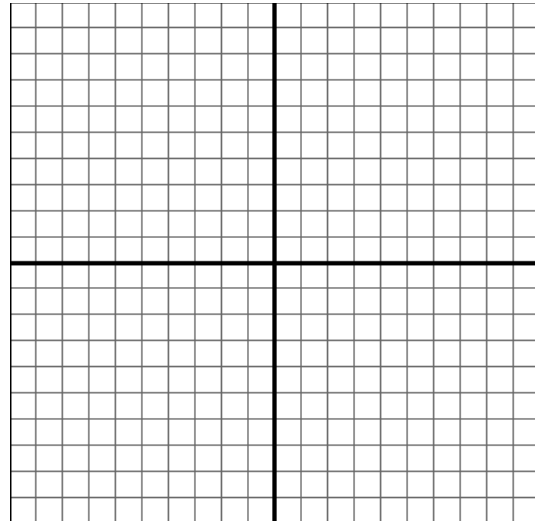
VII. Radicals and Rational Exponents

Graph the functions below

1. $f(x) = \sqrt{x+3} - 2$



2. $g(x) = \sqrt[3]{x-1} + 4$



Solve the equations below. Check for extraneous solutions.

3. $\sqrt[3]{4x-2} = 2\sqrt[3]{x+6}$

4. $\sqrt{x+7} = x+5$

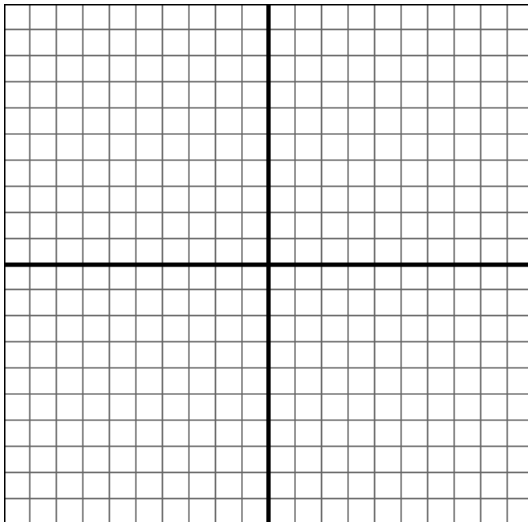
5. $3x^{\frac{4}{3}} - 7 = 41$

6. $4(x-3)^{\frac{3}{2}} + 12 = 120$

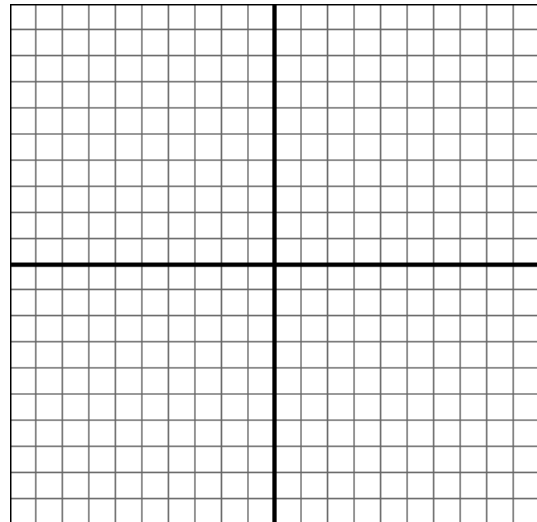
VIII. Rational Functions

Graph the functions below

1. $f(x) = \frac{1}{x} + 3$



2. $g(x) = \frac{2x+4}{x-1} - 3$



Solve the equations below. **Check for extraneous solutions.**

3. $\frac{10}{x+4} = \frac{15}{4x+4}$

4. $\frac{x}{x-2} + \frac{1}{x-4} = \frac{2}{x^2 - 6x + 8}$

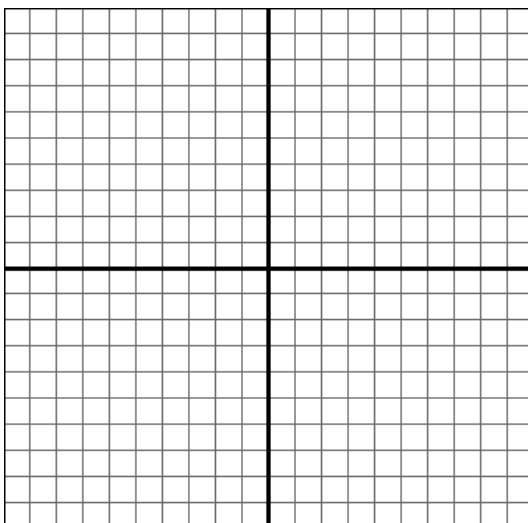
5. $\frac{10}{x^2 - 2x} + \frac{4}{x} = \frac{5}{x-2}$

6. $\frac{x-6}{x^2 + 4x - 5} + \frac{x}{x^2 - 4x + 3} = \frac{2}{x^2 + 2x - 15}$

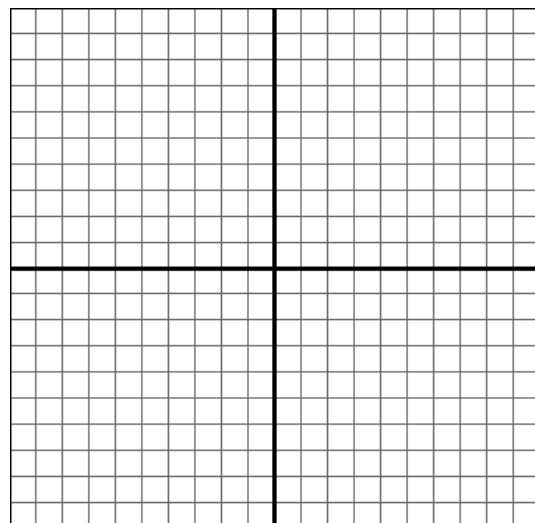
IX. Quadratic Equations and Vertex Form

Graph the functions below

1. $f(x) = -3x^2 - 6x + 7$



2. $g(x) = (x+5)^2 + 3$



Rewrite the quadratic equations in vertex form, $f(x) = a(x - h)^2 + k$, by completing the square.

3. $f(x) = x^2 + 6x + 12$

4. $g(x) = x^2 - 7x + 9$

5. $h(x) = 3x^2 + 6x - 14$

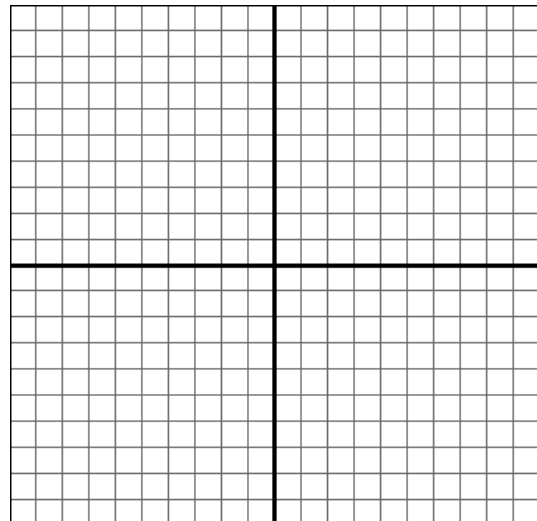
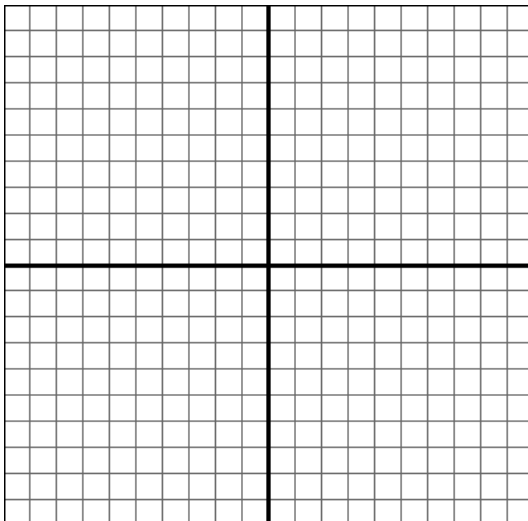
6. $j(x) = 2x^2 - 11x - 18$

X. Piecewise Functions

In 1-3, graph the functions below. In 4, write the rule of the function.

$$1. f(x) = \begin{cases} -\frac{1}{2}x + 1 & -8 \leq x < -4 \\ 5 & -4 \leq x \leq 4 \\ \frac{3}{4}x + 2 & x > 4 \end{cases}$$

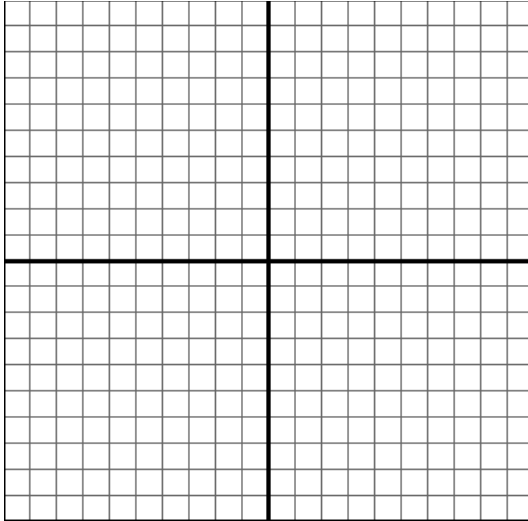
$$2. g(x) = \begin{cases} x & -9 \leq x < -3 \\ (x + 2)^2 - 6 & -3 \leq x < 2 \\ \sqrt{x - 2} + 1 & 2 \leq x \leq 6 \end{cases}$$



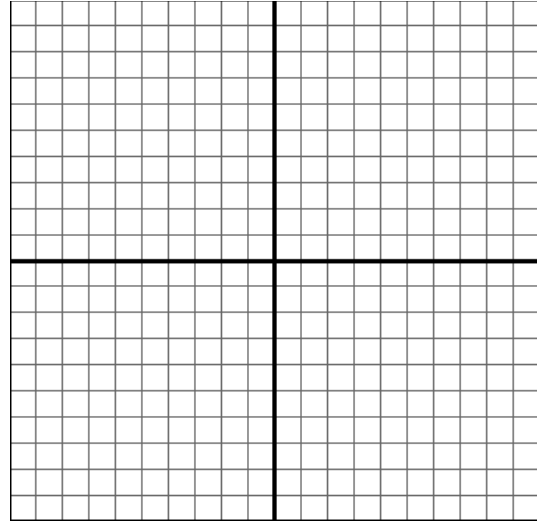
XII. Logarithmic and Exponential Functions

Graph the functions below

1. $f(x) = 6\left(\frac{1}{3}\right)^{x-4} - 8$



2. $g(x) = \log_3(x+4) - 2$



Evaluate

3. $\log_5 25$

4. $\ln 1$

5. $\log_8 32$

6. $\log_2\left(\frac{1}{8}\right)$

Find the inverse of each function below.

7. $f(x) = \log_4(x-5) + 3$

8. $g(x) = 3\left(\frac{1}{2}\right)^{x-1} + 6$