

PRE-CALCULUS 11
TERM 3 EXAM
REVIEW

A. Things to Know

1. Radicals
2. Quadratic Equations
3. Quadratic Functions
4. Graphing Inequalities & Systems of Equations
5. Trigonometry
6. Rational Expressions
7. Exponent Laws

B. Radicals

1. Simplify the following.

a) $\sqrt{125}$

b) $\sqrt[4]{96}$

c) $\sqrt{81} + \sqrt{50} - \sqrt{121} + \sqrt{98}$

d) $\sqrt[3]{24} - \sqrt[3]{81}$

e) $(-3\sqrt{6})(2\sqrt{2})$

f) $(3\sqrt{3} - \sqrt{8})^2$

2. Rationalize the denominator.

a) $\frac{2\sqrt{3}}{3\sqrt{6}}$

b) $\frac{\sqrt{8} + \sqrt{6}}{\sqrt{6} - \sqrt{2}}$

3. Solving the following radical equations.

a) $2\sqrt{2x+4} + 12 = 4, x \geq -2$

e) $\sqrt{-3x+7} = \sqrt{-2x+9}, x \geq \frac{7}{3} \text{ or } x \geq \frac{9}{2}$

C. Quadratic Equations

1. Factor the following completely.

a) $75a^2b - 48b^3$

b) $18m^3 + 12m^2 + 2m$

2. Solving the quadratic equation $x^2 = -\frac{7}{2}x - 3$, by factoring.

3. Solve the quadratic equation $2x^2 - 10x - 20 = 4x^2 + 6x$, by completing the square.

4. Solve the quadratic equation $x^2 + 4x - 1 = 0$, using the Quadratic Formula.

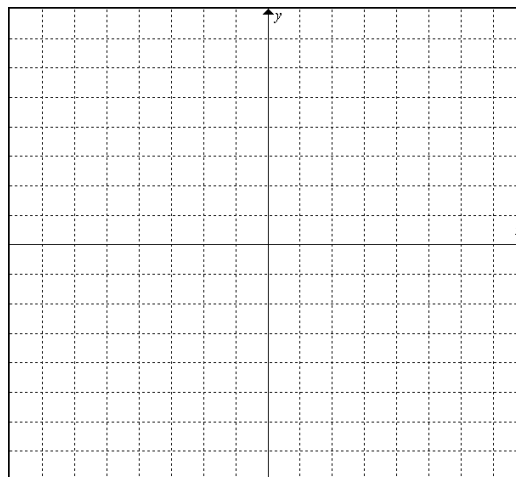
D. Quadratic Functions

1. Find the coordinates of the x and y-intercepts for $y = 3x^2 + 18x - 21$.

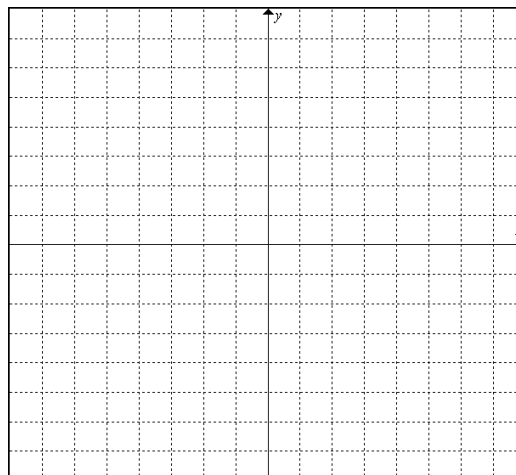
2. Put the function $y = 3(x+2)(x-6)$ into Standard Form $y = a(x-p)^2 + q$.

3. Write the equation of a quadratic function in General Form $y = ax^2 + bx + c$ with roots of 4 and -1 and passing through the point (3,3).

4. Put the quadratic function $y = 2x^2 - 12x + 16$ into Factored Form $y = a(x - r_1)(x - r_2)$. Then graph the function, making sure to include the vertex, the coordinates of the x & y intercepts and at least one other point.

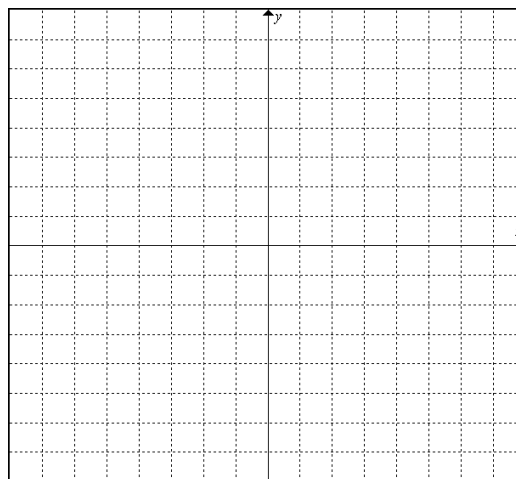


5. Put the quadratic function $y = -\frac{1}{2}x^2 - 2x - 1$ into Standard Form $y = a(x - p)^2 + q$, then identify the coordinates of the vertex, the axis of symmetry, graph the function and determine the domain and range of the function.

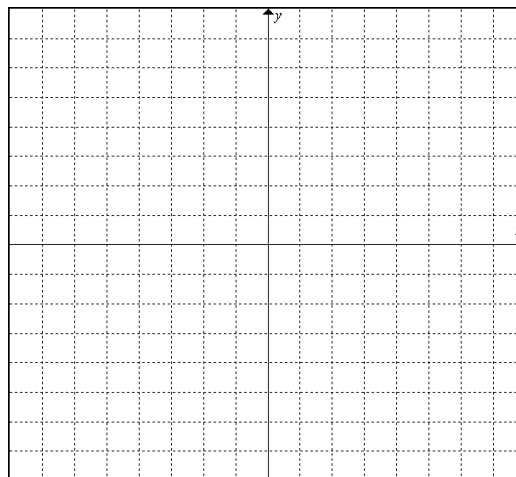


E. Graphing Inequalities & Systems of Equations

1. Graph the linear inequality $2x - 3y < -6$.



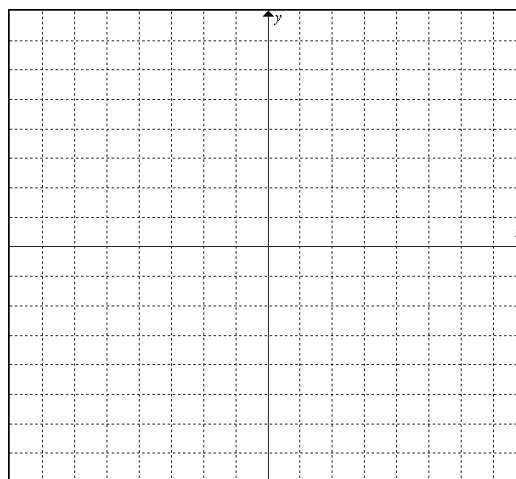
2. Graph the quadratic inequality $y \geq 2x^2 + 4x - 6$.



3. Solve the non-linear system by graphing:

$$x - y = -2$$

$$y = -x^2 + 2x + 4$$



4. Solve the following linear systems:

a) $6x - 2y = 21$ by Substitution Method
 $4x + 3y = 1$

b) $8x - y = 16$ by Elimination Method
 $2x - 3y = 2$

G. Trigonometry

1. The point $P(2, -6)$ lies on the terminal arm of an angle θ in standard position.

- Determine the primary trigonometric ratios of θ .
- Determine the measure of θ to the nearest degree.

2. If $\angle \theta$ is a point on the unit circle with coordinates $\left(-\frac{\sqrt{3}}{3}, \frac{\sqrt{6}}{3}\right)$. Determine the measure of $\angle \theta$ to the nearest degree.

3. Use your knowledge of special triangles and the unit circle to determine the exact primary trigonometric ratios for an angle of 300° . Make sure to rationalize any denominators.

4. In $\triangle ABC$, $BC = 10$ cm, $AB = 12$ cm, and $\angle A = 45^\circ$. Determine the measure of $\angle ABC$.

5. Solve the following $\triangle ABC$ if $BC = 8$ cm, $AC = 12$ cm and $AB = 15$ cm.

Assignment: Pg. 162 #2 – 5
Pg. 242 #1 – 10
Pg. 330 #1, 5, 6, 7, 8
Pg. 408 #1a, 3, 5, 10
Pg. 510 #1 - 9

Answers

Absolute Value & Radicals

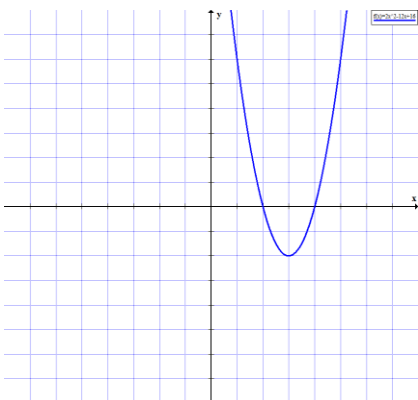
- a) $5\sqrt{5}$ b) $2\sqrt[4]{6}$ c) $-2+12\sqrt{2}$ d) $-\sqrt[3]{3}$ e) $-12\sqrt{3}$ f) $35-12\sqrt{6}$
- a) $\frac{\sqrt{2}}{3}$ b) $\frac{5+3\sqrt{3}}{2}$
- a) No Solution b) $x = -2$

Quadratic Equations

- a) $3b(5a+4b)(5a-4b)$ b) $2m(3m+1)^2$
- $x = -\frac{3}{2}, -2$
- $x = -4 \pm \sqrt{6}$
- $x = -2 \pm \sqrt{5}$

Quadratic Functions

- x-int $(-7,0)$ & $(1,0)$, y-int $(0,-21)$
- $y = 3(x-2)^2 - 48$
- $y = -\frac{3}{4}x^2 + \frac{9}{4}x + 3$
-



$$y = 2(x-4)(x-2)$$

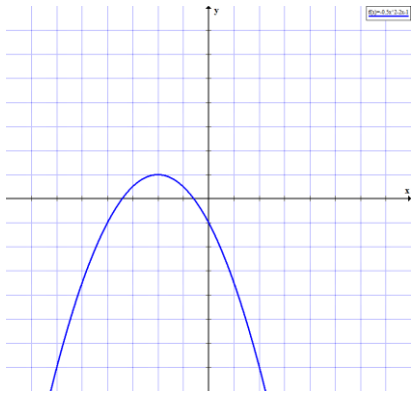
vertex $(3,-2)$

x-int $(4,0)$ & $(2,0)$

y-int $(0,16)$

other point $(1,6)$ or $(5,6)$

5.



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

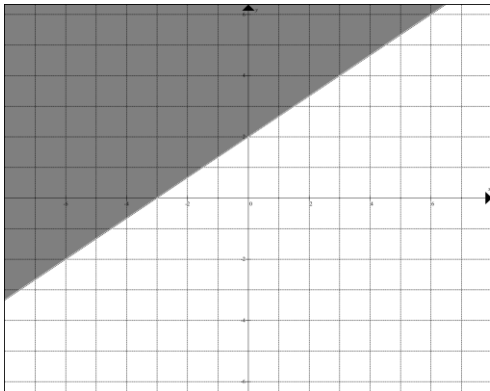
vertex $(-2, 1)$

Axis of Sym $x = -2$

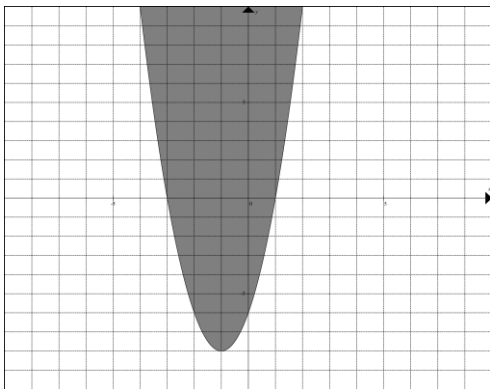
Domain $x \in \mathbb{R}$ Range $y \leq 1$

Graphing Inequalities & Systems of Equations

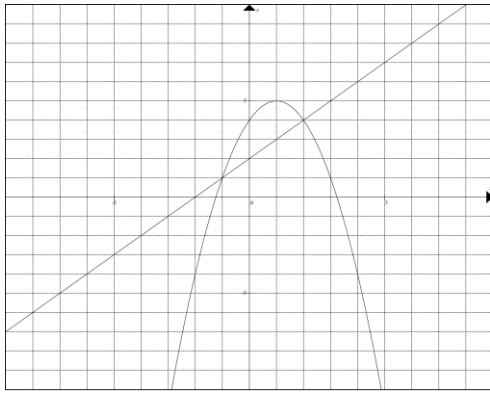
1.



2.



3.



$(-1, 1)$ & $(2, 4)$

4. a) $\left(\frac{5}{2}, -3\right)$ b) $\left(\frac{23}{11}, \frac{8}{11}\right)$

G. Trigonometry

- a) $\sin \theta = -\frac{3\sqrt{10}}{10}$, $\cos \theta = \frac{\sqrt{10}}{10}$, $\tan \theta = -3$
b) $\angle \theta = 288^\circ$
- $\angle \theta = 125^\circ$
- $\sin 300^\circ = -\frac{\sqrt{3}}{2}$, $\cos 300^\circ = \frac{1}{2}$, $\tan 300^\circ = -\sqrt{3}$
- $\angle ABC = 77^\circ$ or $\angle ABC = 13^\circ$
- $\angle A = 32^\circ$, $\angle B = 53^\circ$, $\angle C = 95^\circ$