

Algebra 1 Competency Exam

To receive the full benefit of this test, watch the student to ensure he has mastered the concepts presented in Algebra 1.

If he demonstrates proficiency, he is ready to move on to Geometry.

If he struggles with the material on this exam, he should begin in Algebra 1.

I. Express in simplest terms (6 points each)

1) $\frac{1}{2}^2 + (ab)^0 \cdot 3^2$

2) $\sqrt{16X^2}$

3) $(3^X)^Y (3^X)$

4) $|6 - 8|$

5) $\sqrt{X^2 + 4X + 4}$

6) $(81^{1/2})^3$

7) $3X^3X^{-1} + \frac{20X^2}{X^{-4}} + \frac{5X}{X^{-1}}$

II. Factor (10 points each)

1) $3X^2 - 27$

2) $5X^2 - 9X - 2$

3) $X^3 + 5X^2 + 6X$

4) $14Y^2 - 7Y - 42$

III. Solve for X. (8 points)

1) $1,000,000 = (10^3)^X$

IV. Solve for X. Factor first if necessary. (10 points each)

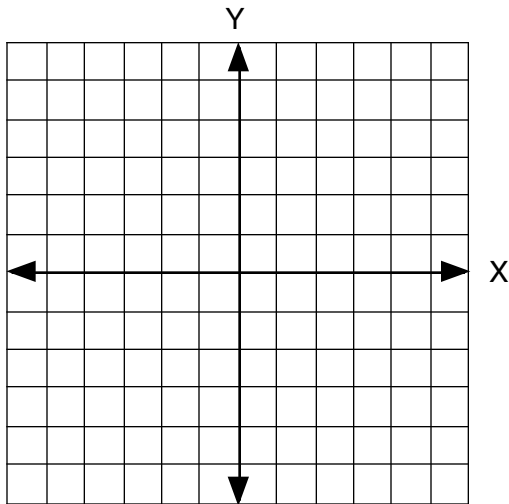
1) $3X^2 - 6X = 0$

2) $\frac{1}{5}X - \frac{1}{2} = \frac{2}{3}$

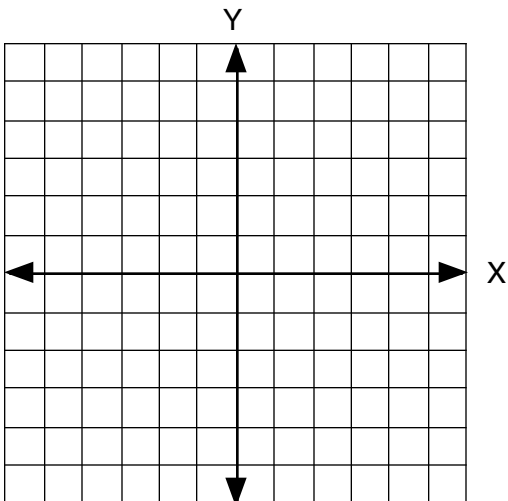
3) $\frac{2}{X} + \frac{14-X}{4} = 4$ (X \neq 0)

V. Graph. (10 points each)

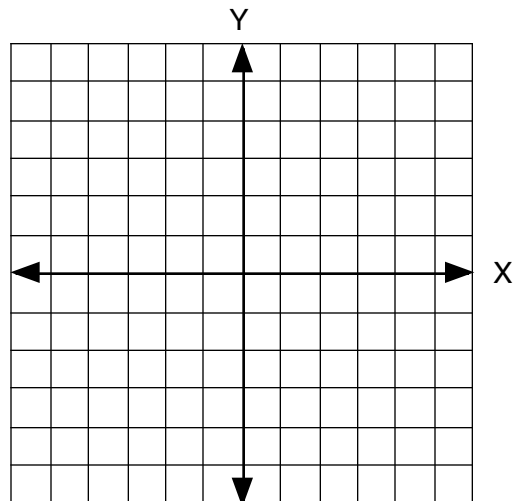
1) $Y = 2X^2$



2) $4X^2 + Y^2 = 16$



3) $Y = 3X + 1$



Solutions

I. 1) $1/4 + 1 - 9 = -31/4 = -7 \frac{3}{4}$

2) $\pm 4X$

3) 3^{XY+X}

4) 2

5) $X + 2$

6) 9^{-3}

7) $3X^2 + 20X^6 + 5X^2 = 8X^2 + 20X^6$

II. 1) $3(X^2 - 9) = 3(X - 3)(X + 3)$

2) $(5X + 1)(X - 2)$

3) $X(X^2 + 5X + 6) = X(X + 2)(X + 3)$

4) $7(2Y^2 - Y - 6) = 7(2Y + 3)(Y - 2)$

III. $10^6 = (10^3)^X$, $6 = 3X$, $X = 2$

IV. 1) $3X(X - 2) = 0$
 $3X(X - 2) = 0$
 $X = 0, X = 2$

2) $6X - 15 = 20$ (multiplying by 30)
 $6X = 35, X = 35/6$

3) $8 + 14X - X^2 = 16X$ (multiplying by 4X)
 $-X^2 - 2X + 8 = 0$
 $X^2 + 2X - 8 = 0$
 $(X - 2)(X + 4) = 0$
 $X = 2, X = -4$

V. on the graphs

