Key

Summer Review Packet for 8th Grade Accelerated Students Going into Advanced Geometry

The following topics were covered in 8th grade accelerated math. They are important for the foundation of advanced geometry.

It is important that students be able to work these problems independently. If outside help is received, it should be on similar problems covering these concepts. It would be beneficial for different problems to be used for examples and/or practice.

Solving Equations

1. $3(x+1)-5=5x-2$

$3x+3-5=5x-2$

$x=0$

2. $4(2x-8)=3(2-3x)$

$8x-32=6-9x$

$17x=38$

$x=38/17$

3. $8(b+1)+4=3(2b-8)-16$

$8b+8+4=6b-24-16$

$8b+12=6b-40$

$2b=-52$

$b=-26$

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

$\frac{3}{2}x+\frac{3}{4}=2$

$\frac{3}{2}x=\frac{5}{4}$

$x=\frac{5}{6}$

5. $\left[\frac{1}{5}m+\frac{2}{3}-2=m-\frac{2}{5}\right]15$

$3m+10-30=15m-6$

$3m-20=15m-6$

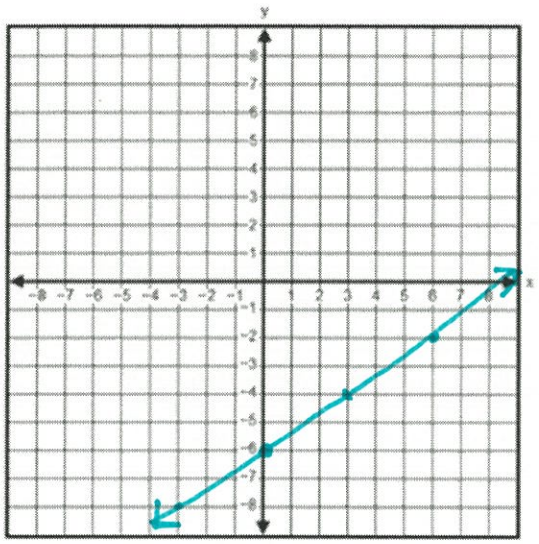
$-14=12m$

$m=-7/6$

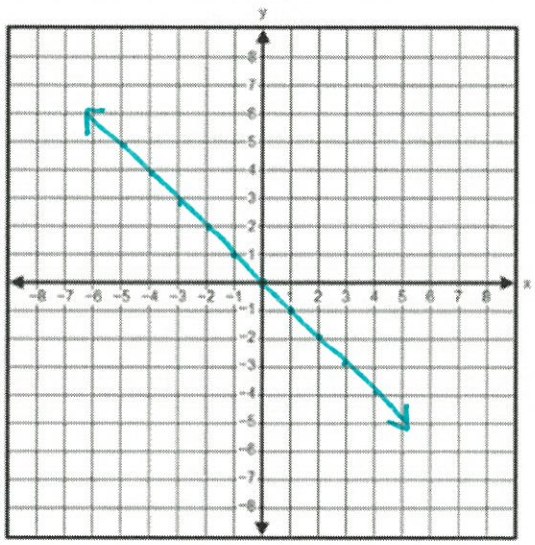
Graphing Lines

Although we covered slope-intercept, standard, and point-slope form, slope-intercept form is the main form used in geometry

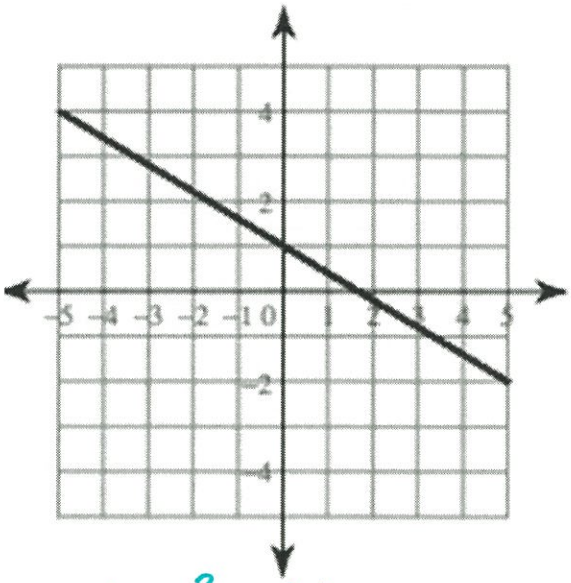
1. Graph $y = \frac{2}{3}x - 6$



2. Graph $y = -x$

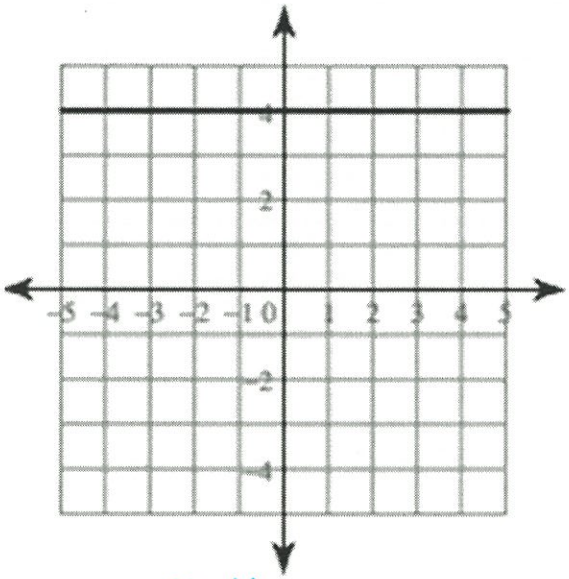


3. Write the equation for the line.



$y = -\frac{3}{5}x + 1$

4. Write the equation for the line.



$y = 4$

Systems of Equations

1. Solve using substitution

$y = 5x - 3$

$-x + 7y = -21$

$-x + 7(5x - 3) = -21$

$-x + 35x - 21 = -21$

$34x = 0$

$x = 0$

$y = 5(0) - 3 = -3$

$(0, -3)$

2. Solve using substitution

$x = -4 - 2y$

$-3x - 2y = 0$

$-3(-4 - 2y) - 2y = 0$

$12 + 6y - 2y = 0$

$4y = -12 \quad y = -3$

$x = -4 - 2(-3)$

$x = -4 + 6$

$x = 2$

$(2, -3)$

3. Solve using elimination

$(-3x - 2y = -2)\,2$

$x + 4y = 6$

$-6x - 4y = -4$

$-5x = 2$

$x = -2/5$

$-\frac{2}{5} + 4y = 6$

$4y = \frac{32}{5}$

$y = 8/5$

$(-2/5, 8/5)$

4. Solve using elimination

$-4x + y = 6$

$4x + 3y = 2$

$4y = 8$

$y = 2$

$-4x + 2 = 6$

$-4x = 4$

$x = -1$

$(-1, 2)$

Radicals

1. Simplify: $\sqrt{180}$

$\sqrt{36}\sqrt{5}$

$6\sqrt{5}$

2. Simplify: $4\sqrt{90}$

$4\sqrt{9}\sqrt{10}$

$4 \cdot 3\sqrt{10}$

$12\sqrt{10}$

3. $5\sqrt{72} + 6\sqrt{8} - 2$

$5\sqrt{36}\sqrt{2} + 6\sqrt{4}\sqrt{2} - 2$

$5 \cdot 6\sqrt{2} + 6 \cdot 2\sqrt{2} - 2$

$42\sqrt{2} - 2$

4. $5(\sqrt{7} + 3)$

$5\sqrt{7} + 15$

5. $(2 - \sqrt{3})^2$

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

$4 - 4\sqrt{3} + 3 = 7 - 4\sqrt{3}$

6. $\frac{6}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{6\sqrt{5}}{5}$

Solve by Factoring

1. $2b^2 + 17b = -21$

$2b^2 + 17b + 21 = 0$

$(2b + 3)(b + 7) = 0$

$b = -3/2, -7$

2. $5p^2 - p - 18 = 0$

$(5p + 9)(p - 2) = 0$

$p = -9/5, 2$

Solve by Factoring Continued

3. $x^2 - 16x + 63 = 0$

$(x-9)(x-7) = 0$

$x = 7, 9$

4. $16x^2 - 121 = 0$

$(4x-11)(4x+11) = 0$

$x = 11/4, -11/4$

5. $4x^3 + 43x^2 + 30x = 0$

$x(4x^2+43x+30) = 0$

$x(4x+3)(x+10) = 0$

$x = 0, -3/4, -10$

6. $10m^2 + 89m = 9$

$10m^2+89m-9 = 0$

$(10m-1)(m+9) = 0$

$m = 1/10, -9$

7. $5x^2 - 30x = 0$

$5x(x-6) = 0$

$x = 0, 6$

8. $20x^3 - 45x^2 = 0$

$5x^2(4x-9) = 0$

$x = 0, 9/4$

Completing the Square

1. $p^2 + 14p - 38 = 0$ $38+49$

$(p+7)^2 = 87$

$p+7 = \sqrt{87}$

$p = -7+\sqrt{87} \approx 2.33$

$p = -7-\sqrt{87} \approx -16.33$

2. $v^2 + 6v - 59 = 0$ $59+9$

$(v+3)^2 = 68$

$v+3 = \sqrt{68}$

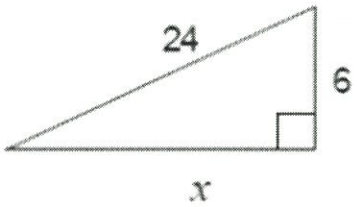
$v = -3+\sqrt{68} \approx -5.25$

$v = -3-\sqrt{68} \approx -11.2$

Pythagorean Theorem

Write answer in simplest radical form when necessary. $10^2+24^2 = x^2$

1.



$6^2 + x^2 = 24^2$

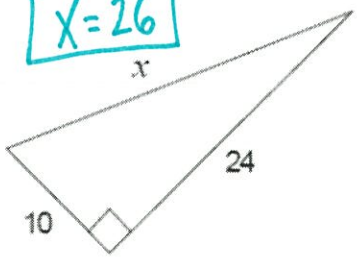
$x^2 = 540$

$x = \sqrt{36}\sqrt{15}$

$x = 6\sqrt{15}$

2.

$x = 26$



3. A ladder is leaning against the side of a house. It reaches 10 meters up the wall. If the base of the ladder is 3 meters away from the house, how tall is the ladder?

$3^2 + 10^2 = x^2$

$x^2 = 109$

$x \approx 10.44$ m

4. Would the side lengths 15, 20, and 25 make a right triangle? $15^2+20^2 = 25^2$

yes

5. Would the side length 20, 21, and 22 make a right triangle? $20^2+21^2 \neq 22^2$

no