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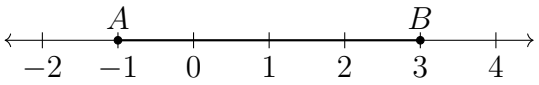
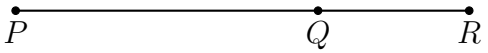
2.7 Test: Solving for length and angle measures

1. Two points $A(-1)$, $B(3)$ and the segment $\overline{AB}$ are shown on the number line.

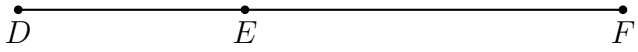


What is the length of the segment $\overline{AB}$? Show your work as an equation.

2. Given $\overline{PQR}$, $PQ = 7\frac{1}{4}$, and $QR = 3\frac{3}{4}$. Find PR.



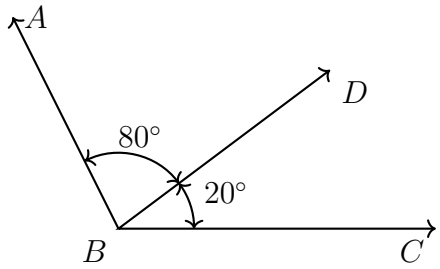
3. Given $\overline{DEF}$, $DE = x + 6$, $EF = 4x + 7$, $DF = 18$. Find DE.



4. Apply the Angle Addition postulate. Write and equation to support your work.

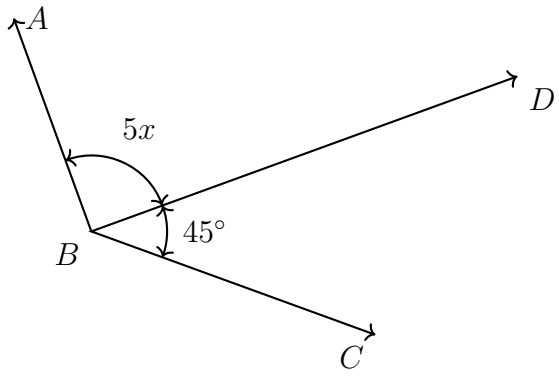
   Given $\text{m}\angle ABD = 80°$ and
   $\text{m}\angle DBC = 20°$.

   Find $m\angle ABC$.

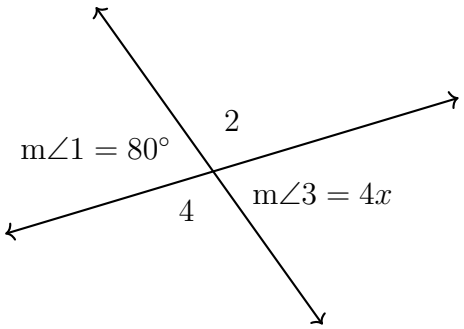


5. Given the angle measures and situation shown, write an equation and solve for x.

   $\text{m}\angle ABD = 5x$
   $\text{m}\angle DBC = 45°$
   $m\angle ABC = 145°$



6. Two lines intersect with $\text{m}\angle 1 = 80°$ and $\text{m}\angle 3 = 4x$. Find x.



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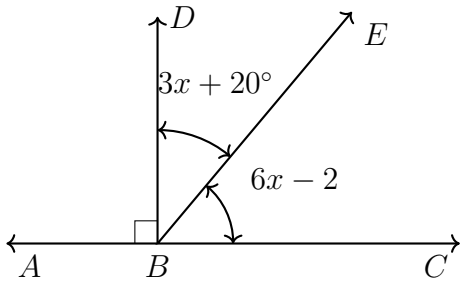
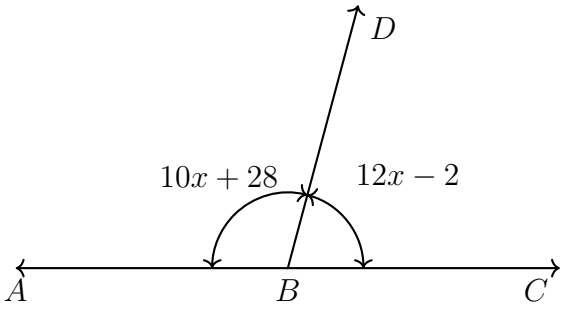
7. Given the angle measures and perpendicular situation shown, $\overrightarrow{BD} \perp \overleftrightarrow{ABC}$. Find x.

   $\text{m}\angle DBE = 3x + 20°$

   $\text{m}\angle EBC = 6x - 2°$

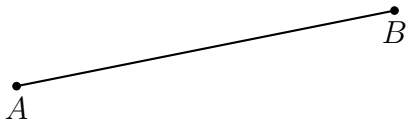


8. A linear pair have measures $\text{m}\angle ABD = 10x + 28°$ and $\text{m}\angle DBC = 12x - 2°$.
   Find $\text{m}\angle ABD$. Check your answer.

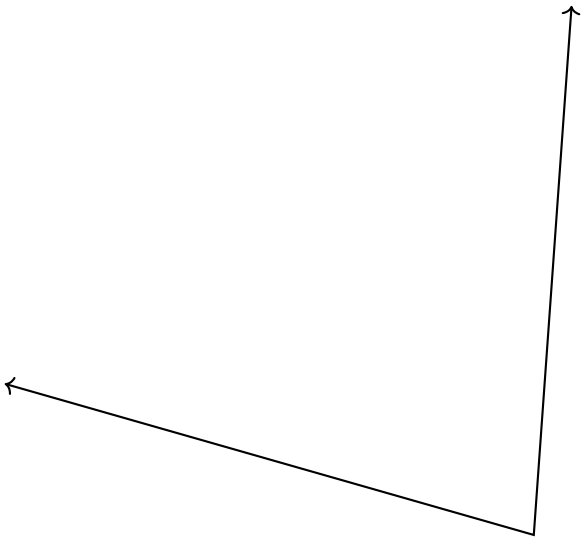


9. Triangle ABC has angle measures $m\angle A = 45°$, $m\angle B = 60°$. Find the measure of the third angle, $m\angle C$.

10. Construct an equilateral triangle with one side $\overline{AB}$.



11. Construct an angle bisector of the given angle.



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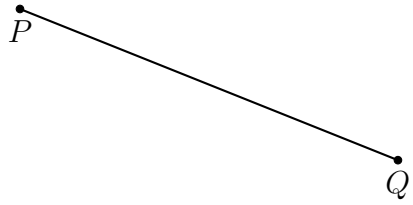
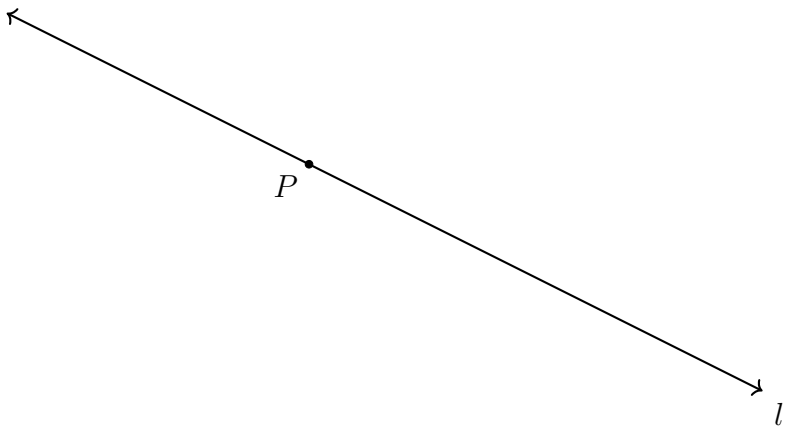
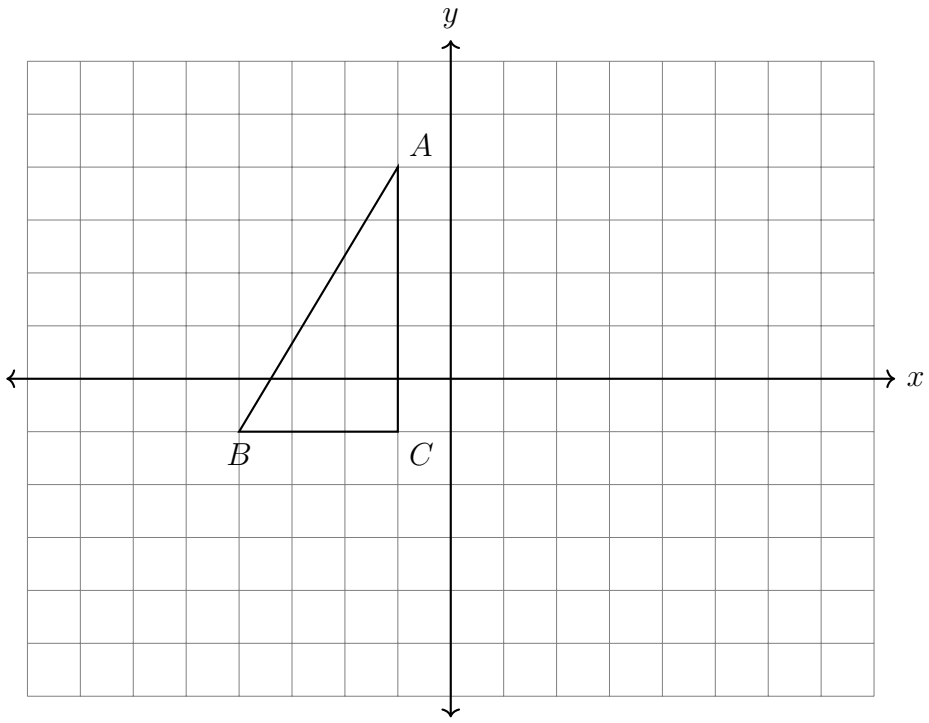
12. Construct a perpendicular bisector of $\overline{PQ}$.



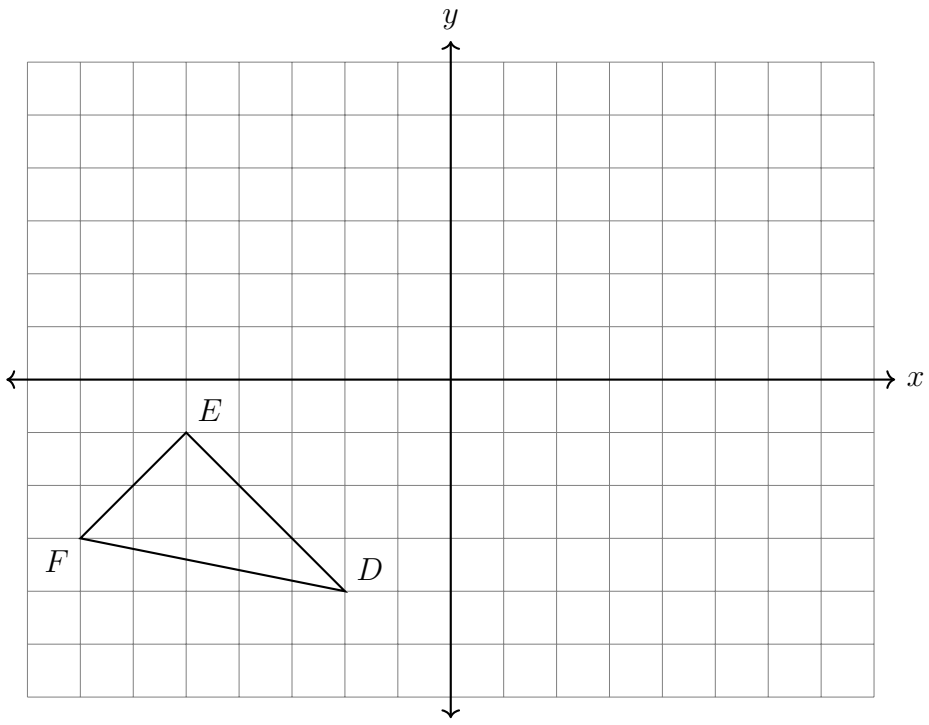
13. Construct a perpendicular to line l through the point P.



14. Translate $\triangle ABC$ right six and down two units. Label the image $\triangle A'B'C'$.



15. Reflect $\triangle DEF$ across the y-axis, labeling the image $\triangle D'E'F'$.



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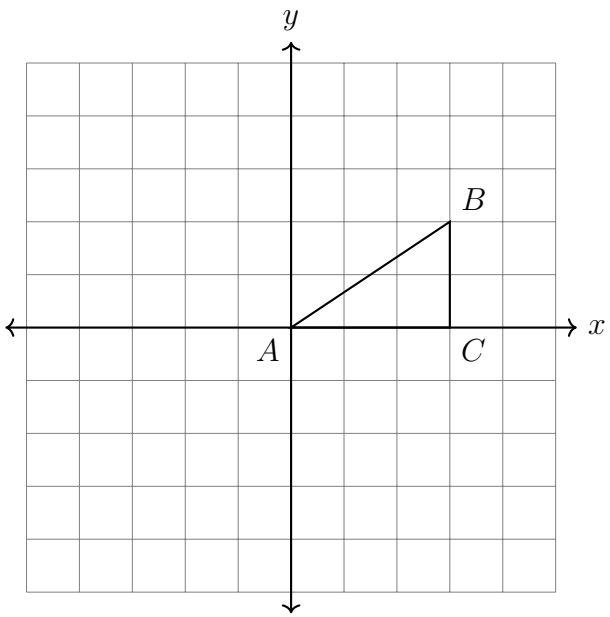
16. Rotate the triangle 90° counterclockwise around the origin, $\triangle ABC \rightarrow \triangle A'B'C'$. Complete the table of the coordinates and plot and label the image on the grid.

$A(0,0) \rightarrow$

$B(3,2) \rightarrow$

$C(3,0) \rightarrow$



17. A reflection maps $P(7,-3)$ onto $P'(7,3)$. Is the reflection across the x-axis or the y-axis?

18. Specify the translation that maps $Q(11,-2) \rightarrow Q'(6,7)$.

19. Triangle $X'Y'Z'$ is the image of triangle XYZ after a translation. Which triangle is larger, or are they the same size? Justify your answer.

20. Simplify each expression by combining like terms. (exact answers only, no decimals)

(a) $6x + 4 - 3x + 2$

(b) $-3y^2 - 5y + 7y + 2y^2$

(c) $4 + 6\pi + 8 - 2\pi$

(d) $10x - 6x + 3\sqrt{7} + 4\sqrt{7}$

21. Use the function $f(x) = \frac{1}{2}x + 5$ to answer the questions.

(a) What is $f(0)$?

(b) Find $f(-2)$

(c) What is x when $f(x) = 15$?

22. Solve each equation for x. Then check your answer.

(a) $3x + 4x - 15 = 34$

(b) $6x - 9 = 7x - 12$