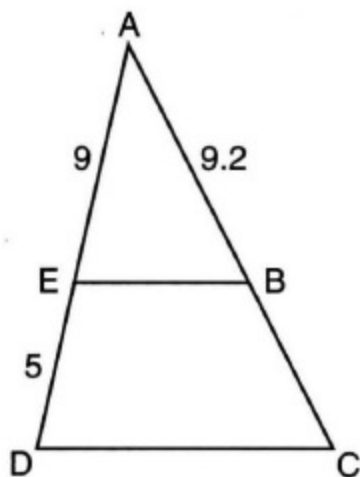1. In the diagram of $\triangle ADC$ below, $\overline{EB} \parallel \overline{DC}$, $AE = 9$, $ED = 5$, and $AB = 9.2$
.

What is the length of $\overline{AC}$, to the *nearest tenth*?

(1) 5.1   (2) 5.2   (3) 14.3   (4) 14.4

2. A three-inch line segment is dilated by a scale factor of 6 and centered at its midpoint. What is the length of its image?

(1) 9 inches   (2) 2 inches   (3) 15 inches   (4) 18 inches

3. The graphs of the lines represented by the equations $y = \frac{1}{3}x + 7$ and $y = -\frac{1}{3}x - 2$ are

(1) intersecting, but not perpendicular
(2) perpendicular
(3) horizontal
(4) parallel

4. If $\triangle ABC$ is dilated by a scale factor of 3, which statement is true of the image $\triangle A'B'C'$?

(1) $m\angle A' = 3(m\angle A)$ (2) $3(m\angle C') = m\angle C$
(3) $B'C' = 3BC$ (4) $3A'B' = AB$

5. What is the image of the point (-5,2) under the translation $T_{3,-4}$?

(1) (-2,-2)   (2) (-8,6)   (3) (-15,-8)   (4) (-9,5)

6. If $\triangle RST \sim \triangle ABC$, $m\angle A = 7 + 8x$, $m\angle C = 4x + 8$, and $m\angle R = 3x - 60$, find $m\angle C$
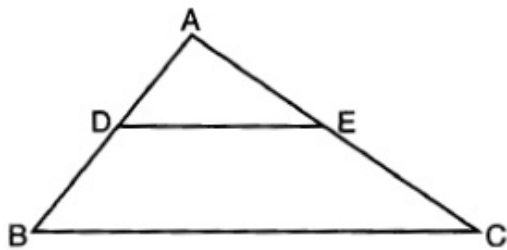
(1) 50   (2) 55   (3) 65   (4) 60

7. As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$.
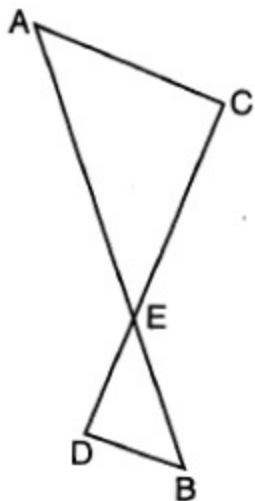
Given $\triangle AEC \sim \triangle BED$, which equation is true?

(1) $\frac{EC}{AE} = \frac{BE}{ED}$ (2) $\frac{ED}{EC} = \frac{AC}{BD}$ (3) $\frac{CE}{DE} = \frac{EB}{EA}$ (4) $\frac{AE}{BE} = \frac{AC}{BD}$

8. In the diagram below, $\triangle ABC \sim \triangle ADE$

Which measurements are justified by this similarity?

(1) $AD = 3$, $AB = 9$, $AE = 5$, and $AC = 10$
(2) $AD = 3$, $AB = 6$, $AE = 4$, and $AC = 12$
(3) $AD = 5$, $AB = 8$, $AE = 7$, and $AC = 10$
(4) $AD = 2$, $AB = 6$, $AE = 5$, and $AC = 15$

9. Which equation represents a line that passes through the point $(-2, 6)$ and is parallel to the line whose equation is $3x - 4y = 6$?

(1) $-3x + 4y = 30$ (2) $4x + 3y = 10$
(3) $-4x + 3y = 26$ (4) $3x + 4y = 18$

10. Which transformation for letter M is shown in the accompanying diagram?
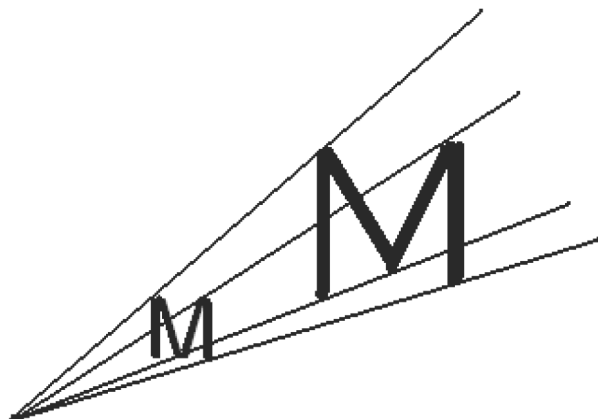
    (1) dilation   (2) translation

    (3) line reflection   (4) rotation

11. Two right triangles must be congruent if

    (1) the corresponding legs are congruent

    (2) the areas are equal

    (3) the lengths of the hypotenuses are equal

    (4) an acute angle in each triangle is congruent

12. The lines whose equations are $2x + 3y = 4$ and $y = mx + 6$ will be perpendicular when *m* is

    (1) $\frac{3}{2}$ (2) $-\frac{3}{2}$ (3) $-\frac{2}{3}$ (4) $\frac{2}{3}$

13. When $\triangle$ABC is dilated by a scale factor of 2, its image is $\triangle$A'B'C'. Which statement is true?

    (1) perimeter of $\triangle$ABC = perimeter of $\triangle$A'B'C'

    (2) $\angle$A $\cong$ $\angle$A'

    (3) 2(area of $\triangle$ABC) = area of $\triangle$A'B'C'

    (4) $\overline{AC} \cong \overline{A'C'}$

14. An equation of a line perpendicular to the line represented by the equation $y = -\frac{1}{2}x - 5$ and passing through $(6, -4)$ is

    (1) $y = 2x - 16$ (2) $y = -\frac{1}{2}x + 4$

    (3) $y = 2x + 14$ (4) $y = -\frac{1}{2}x - 1$

15. When the transformation $T_{2,-1}$ is performed on point A, its image is point $A'(-3, 4)$. What are the coordinates of A?

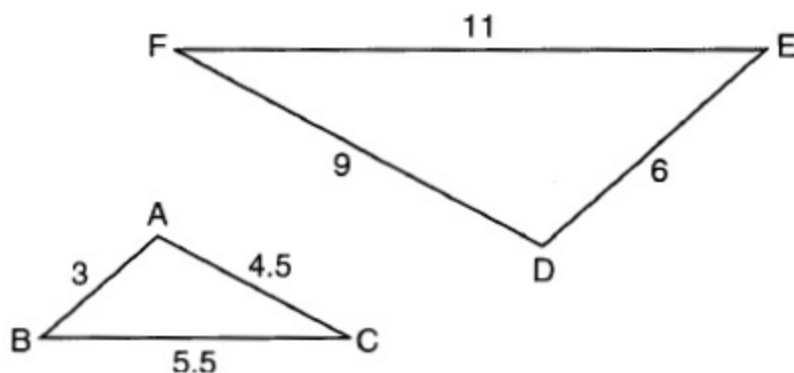   (1) $(-1, 3)$ (2) $(-6, -4)$ (3) $(5, -5)$ (4) $(-5, 5)$

16. A polygon is transformed according to the rule: $(x, y) \rightarrow (x + 2, y)$. Every point of the polygon moves two units in which direction?

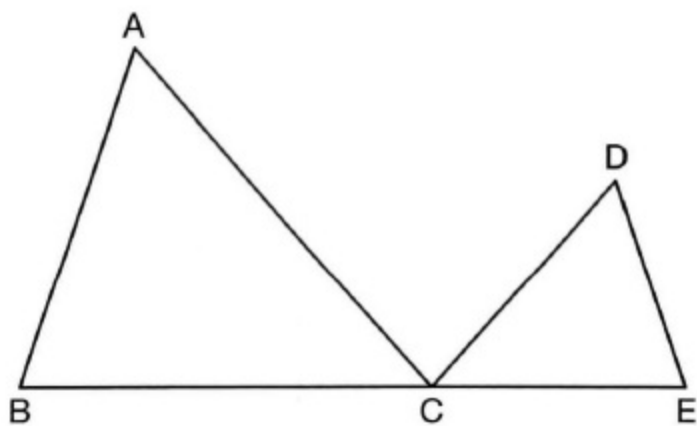   (1) down   (2) left   (3) up   (4) right

17. In the diagram below, $\triangle DEF$ is the image of $\triangle ABC$ after a clockwise rotation of 180° and a dilation where $AB = 3$, $BC = 5.5$, $AC = 4.5$, $DE = 6$, $FD = 9$, and $EF = 11$.

   Which relationship must always be true?

   (1) $\frac{m\angle A}{m\angle C} = \frac{m\angle F}{m\angle D}$ (2) $\frac{m\angle A}{m\angle D} = \frac{1}{2}$

   (3) $\frac{m\angle C}{m\angle F} = \frac{2}{1}$ (4) $\frac{m\angle B}{m\angle E} = \frac{m\angle C}{m\angle F}$
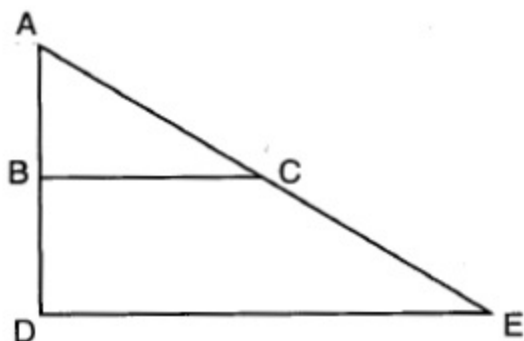
18. In the diagram below, $\triangle ABC \sim \triangle DEC$.

   If $AC = 12$, $DC = 7$, $DE = 5$, and the perimeter of $\triangle ABC$ is 30, what is the perimeter of $\triangle DEC$?

   (1) 12.5   (2) 14.0   (3) 14.8   (4) 17.5

19. The image of $\triangle ABC$ after a dilation of scale factor k centered at point A is $\triangle ADE$, as shown in the diagram below.

Which statement is always true?

(1) $AC = CE$ (2) $\overline{BC} \parallel \overline{DE}$

(3) $\overline{AD} \perp \overline{DE}$ (4) $2AB = AD$

20. Which transformation would *not* always produce an image that would be congruent to the original figure?

(1) dilation   (2) rotation   (3) reflection   (4) translation

21. One function of a movie projector is to enlarge the image on the film. This procedure is an example of a

(1) dilation   (2) line reflection

(3) line of symmetry   (4) translation

22. In triangle *CHR*, *O* is on $\overline{HR}$, and *D* is on $\overline{CR}$ so that $\angle H \cong \angle RDO$.
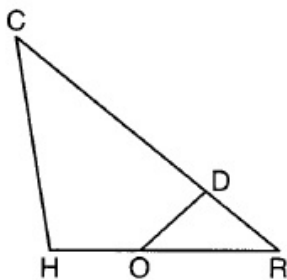
If *RD* = 4, *RO* = 6, and *OH* = 4, what is the length of $\overline{CD}$?

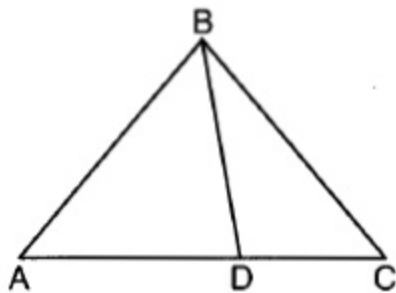(1) 11   (2) 15   (3) $2\frac{2}{3}$ (4) $6\frac{2}{3}$

23. In the diagram below, $\triangle ABE$ is the image of $\triangle ACD$ after a dilation centered at the origin. The coordinates of the vertices are $A(0,0)$, $B(3,0)$, $C(4.5,0)$, $D(0,6)$, and $E(0,4)$.
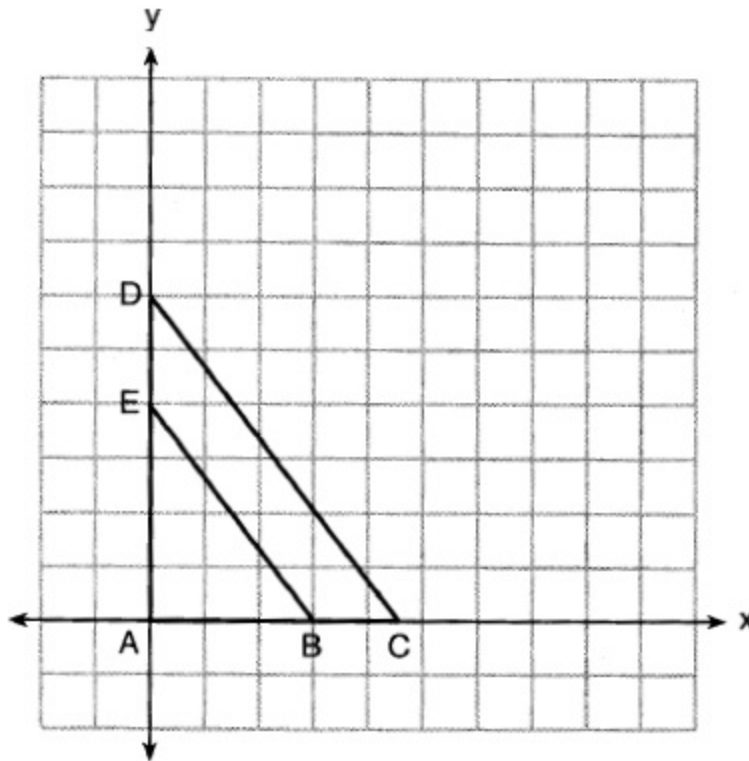
The ratio of the lengths of $\overline{BE}$ to $\overline{CD}$ is

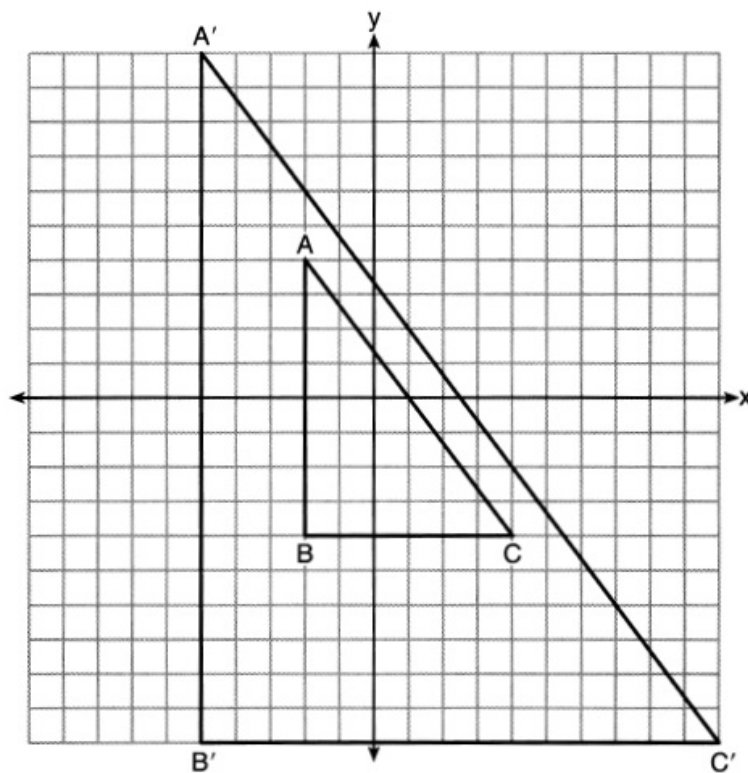(1) $\frac{3}{4}$ (2) $\frac{4}{3}$ (3) $\frac{3}{2}$ (4) $\frac{2}{3}$

24. the diagram below, $m\angle BDC = 100°$ and $m\angle A = 50°$, and $m\angle DBC = 30°$.

Which statement is true?

(1) $m\angle ABD = 80°$ (2) $\triangle ABD$ is scalene.

(3) $\triangle ABD$ is obtuse.   (4) $\triangle ABC$ is isoceles.

25. In the diagram below, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a transformation.

Describe the transformation that was performed.

Explain why $\triangle A'B'C' \sim \triangle ABC$.

26. On the provided set of axes below, graph a triangle whose coordinates are A (2,1), B(6,2), and C(3,5). With respect to this triangle, draw a dilation of scale factor 2 whose center of dilation is (2,1).