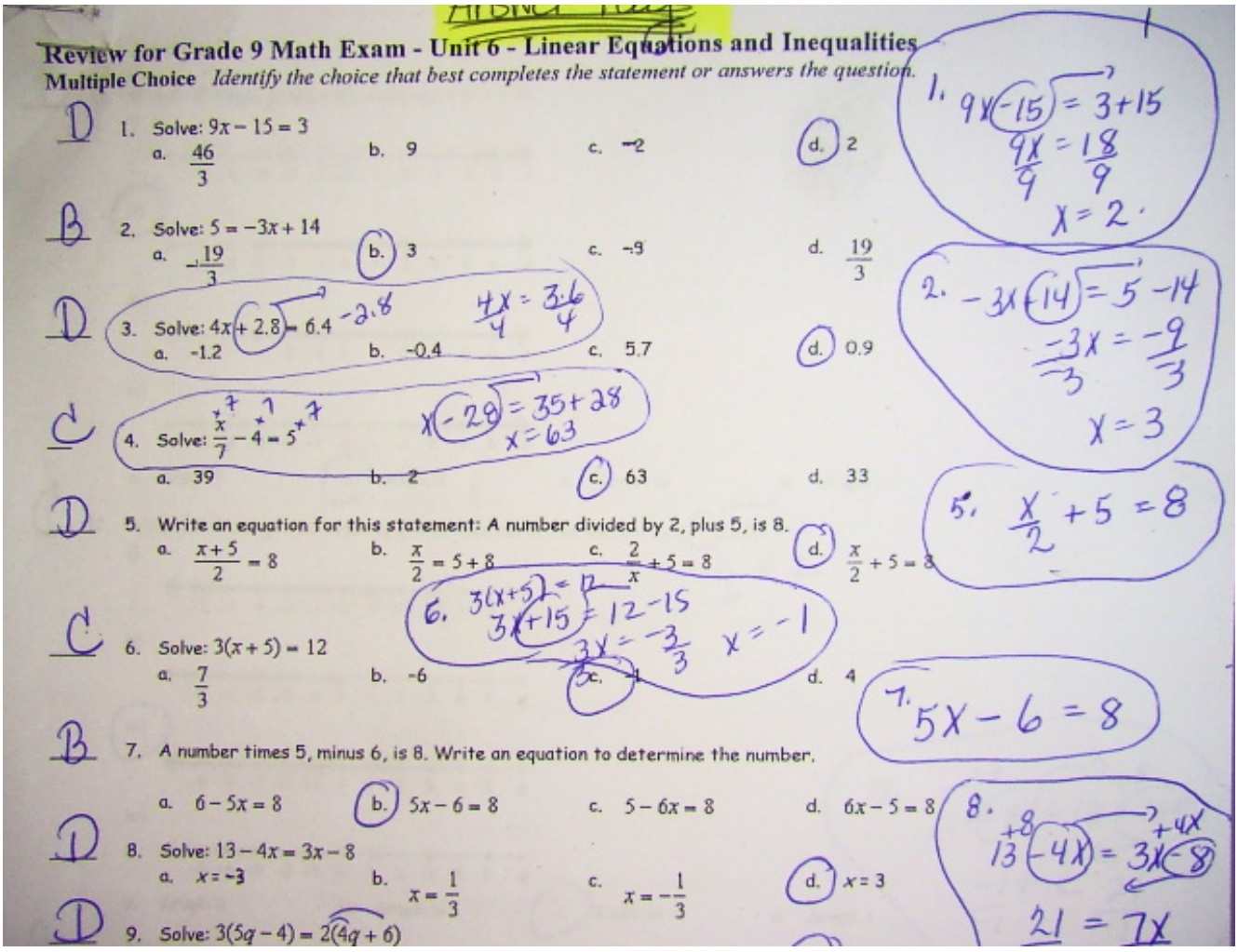


Review for Grade 9 Math Exam - Unit 6 - Linear Equations and Inequalities

Multiple Choice *Identify the choice that best completes the statement or answers the question.*

D 1. Solve: $9x - 15 = 3$

a. $\frac{46}{3}$ b. 9 c. -2 d. 2

B 2. Solve: $5 = -3x + 14$

a. $-\frac{19}{3}$ b. 3 c. -9 d. $\frac{19}{3}$

D 3. Solve: $4x + 2.8 = 6.4$

a. -1.2 b. -0.4 c. 5.7 d. 0.9

C 4. Solve: $\frac{x}{7} - 4 = 5$

a. 39 b. 2 c. 63 d. 33

D 5. Write an equation for this statement: A number divided by 2, plus 5, is 8.

a. $\frac{x+5}{2} = 8$ b. $\frac{x}{2} = 5 + 8$ c. $\frac{2}{x} + 5 = 8$ d. $\frac{x}{2} + 5 = 8$

C 6. Solve: $3(x + 5) = 12$

a. $\frac{7}{3}$ b. -6 c. 1 d. 4

B 7. A number times 5, minus 6, is 8. Write an equation to determine the number.

a. $6 - 5x = 8$ b. $5x - 6 = 8$ c. $5 - 6x = 8$ d. $6x - 5 = 8$

D 8. Solve: $13 - 4x = 3x - 8$

a. $x = -3$ b. $x = \frac{1}{3}$ c. $x = -\frac{1}{3}$ d. $x = 3$

D 9. Solve: $3(5q - 4) = 2(4q + 6)$

1. $9x - 15 = 3 + 15$, $\frac{9x}{9} = \frac{18}{9}$, $x = 2$

2. $-3x + 14 = 5 - 14$, $\frac{-3x}{-3} = \frac{-9}{-3}$, $x = 3$

5. $\frac{x}{2} + 5 = 8$

6. $3(x+5) = 12$, $3x + 15 = 12 - 15$, $\frac{3x}{3} = \frac{-3}{3}$, $x = -1$

7. $5x - 6 = 8$

8. $13 + 8 - 4x = 3x - 8 + 4x$, $21 = 7x$

7. A number times 5, minus 6, is 8. Write an equation to determine the number.

a. $6-5x=8$ b. $5x-6=8$ c. $5-6x=8$ d. $6x-5=8$

8. Solve: $13-4x=3x-8$

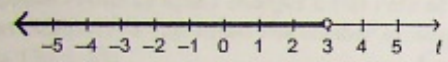
a. $x=-3$ b. $x=\frac{1}{3}$ c. $x=-\frac{1}{3}$ d. $x=3$

9. Solve: $3(5q-4)=2(4q+6)$

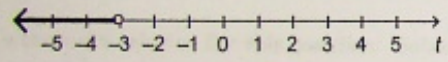
a. $q=3\frac{3}{7}$ b. $q=\frac{7}{24}$ c. $q=-\frac{7}{24}$ d. $q=3\frac{3}{7}$

10. Which of these graphs is a solution of $t \leq 3$?

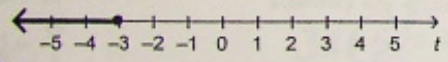
i)



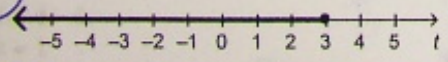
ii)



iii)



iv)



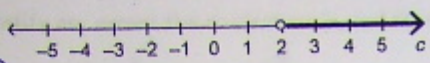
a. Graph ii b. Graph iii c. Graph iv d. Graph i

8. $13-4x=3x-8$, $-8\ -8$, $21=7x$, $\frac{21}{7}=\frac{7x}{7}$, $x=3$

9. $3(5q-4)=2(4q+6)$, $15q-12=8q+12$, $-8q\ -8q$, $7q=24$, $\frac{7q}{7}=\frac{24}{7}$, $q=\frac{24}{7}$, $3\frac{3}{7}$

11. Which of these graphs is a solution of $c > -3$?

i)



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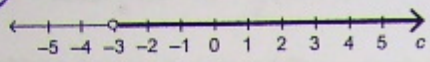

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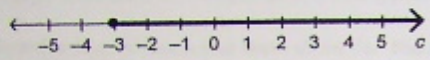
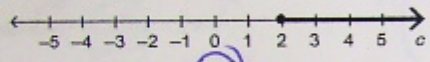


iv)



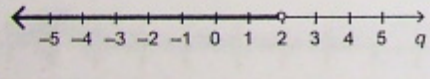
a. Graph i b. Graph ii c. Graph iv d. Graph iii

C

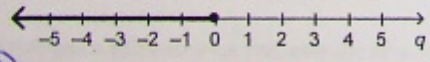
12. Which of these graphs represent the solution of the inequality $q - 2 \leq 0$? $+2$

$q \leq 2$

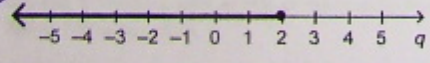
i)



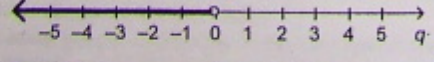
ii)



iii)

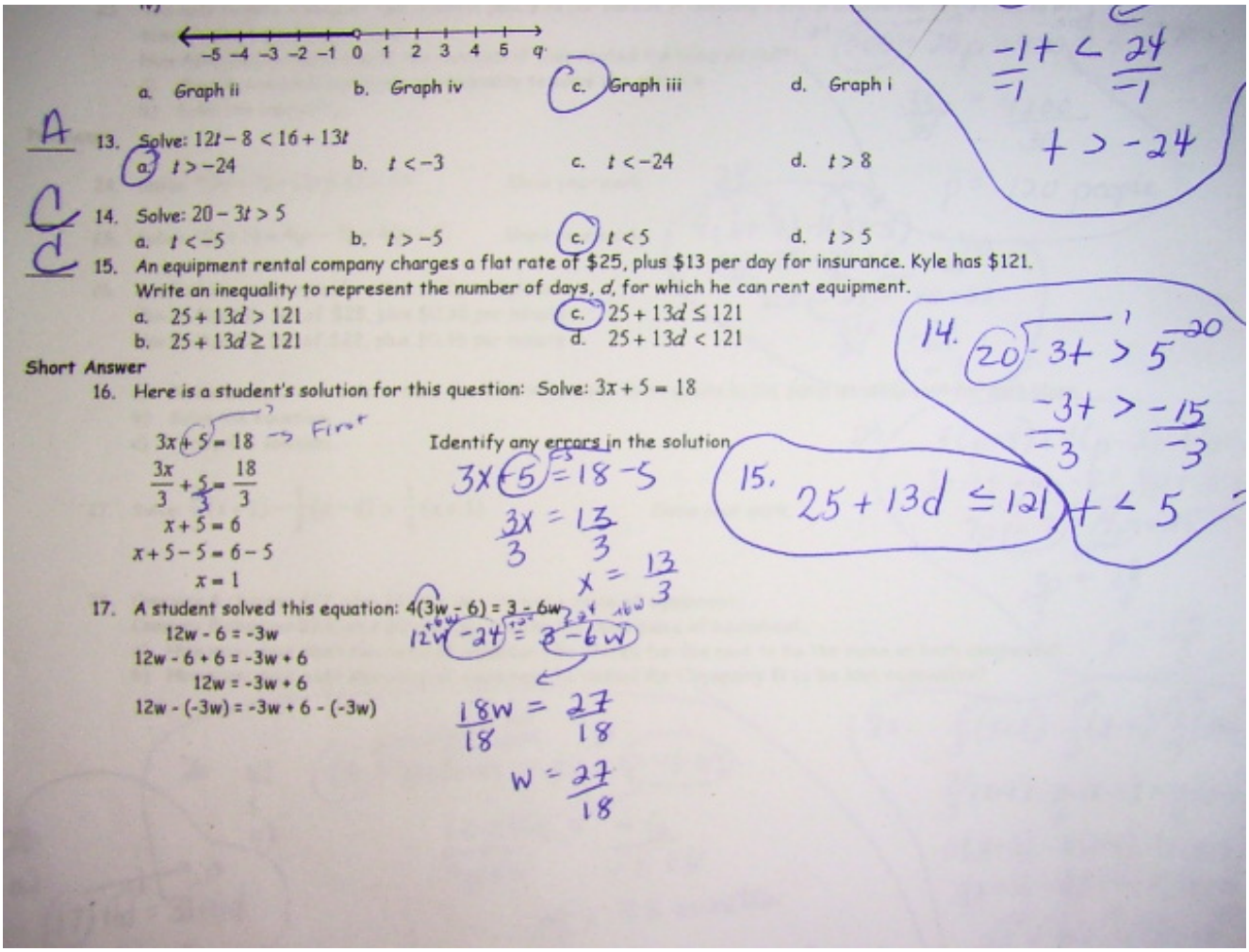


iv)



a. Graph ii b. Graph iv c. Graph iii d. Graph i

13. $-13 +$
$12 + (-8) <$
$-1 <$
$= -1$


-5 -4 -3 -2 -1 0 1 2 3 4 5 q
a. Graph ii b. Graph iv c. Graph iii d. Graph i
A
13. Solve: $12t - 8 < 16 + 13t$
a. $t > -24$ b. $t < -3$ c. $t < -24$ d. $t > 8$
C
14. Solve: $20 - 3t > 5$
a. $t < -5$ b. $t > -5$ c. $t < 5$ d. $t > 5$
C
15. An equipment rental company charges a flat rate of $25, plus $13 per day for insurance. Kyle has $121. Write an inequality to represent the number of days, d, for which he can rent equipment.
a. $25 + 13d > 121$ c. $25 + 13d \leq 121$
b. $25 + 13d \geq 121$ d. $25 + 13d < 121$
Short Answer
16. Here is a student's solution for this question: Solve: $3x + 5 = 18$
$3x + 5 = 18$ -> First
$\frac{3x}{3} + \frac{5}{3} = \frac{18}{3}$
$x + 5 = 6$
$x + 5 - 5 = 6 - 5$
$x = 1$
Identify any errors in the solution
$3x + 5 = 18 - 5$
$\frac{3x}{3} = \frac{13}{3}$
$x = \frac{13}{3}$
17. A student solved this equation: $4(3w - 6) = 3 - 6w$
$12w - 6 = -3w$
$12w - 6 + 6 = -3w + 6$
$12w = -3w + 6$
$12w - (-3w) = -3w + 6 - (-3w)$
$12w - 24 = 3 - 6w$
$\frac{18w}{18} = \frac{27}{18}$
$w = \frac{27}{18}$
$-1t < 24$
$\frac{-1}{-1} \quad \frac{24}{-1}$
$t > -24$
14. $20 \quad -3t > 5 \quad -20$
$\frac{-3t}{-3} > \frac{-15}{-3}$
15. $25 + 13d \leq 121$ $t < 5$

$15w = 6$

$w = \frac{6}{15}$

Identify any errors the student made, and then solve the original equation above.

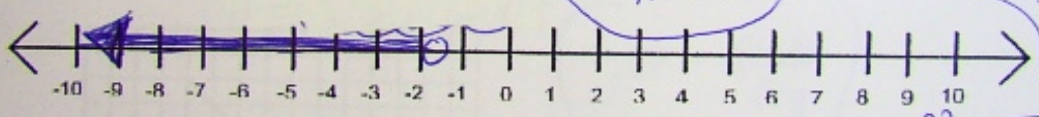
18. Solve: $\frac{3}{4}(5x-4) = \frac{1}{2}(4x+3)$

19. Car Rental Company A charges $29 a week, plus $13 per kilometre driven.
Car Rental Company B charges $85 a week, plus $6 per kilometre driven.

Determine the distance you must drive for the ~~two rental costs~~ to be the same.
Model the problem with an equation.

20. Solve: $8w - 4 \geq 7w - 2 + 4$

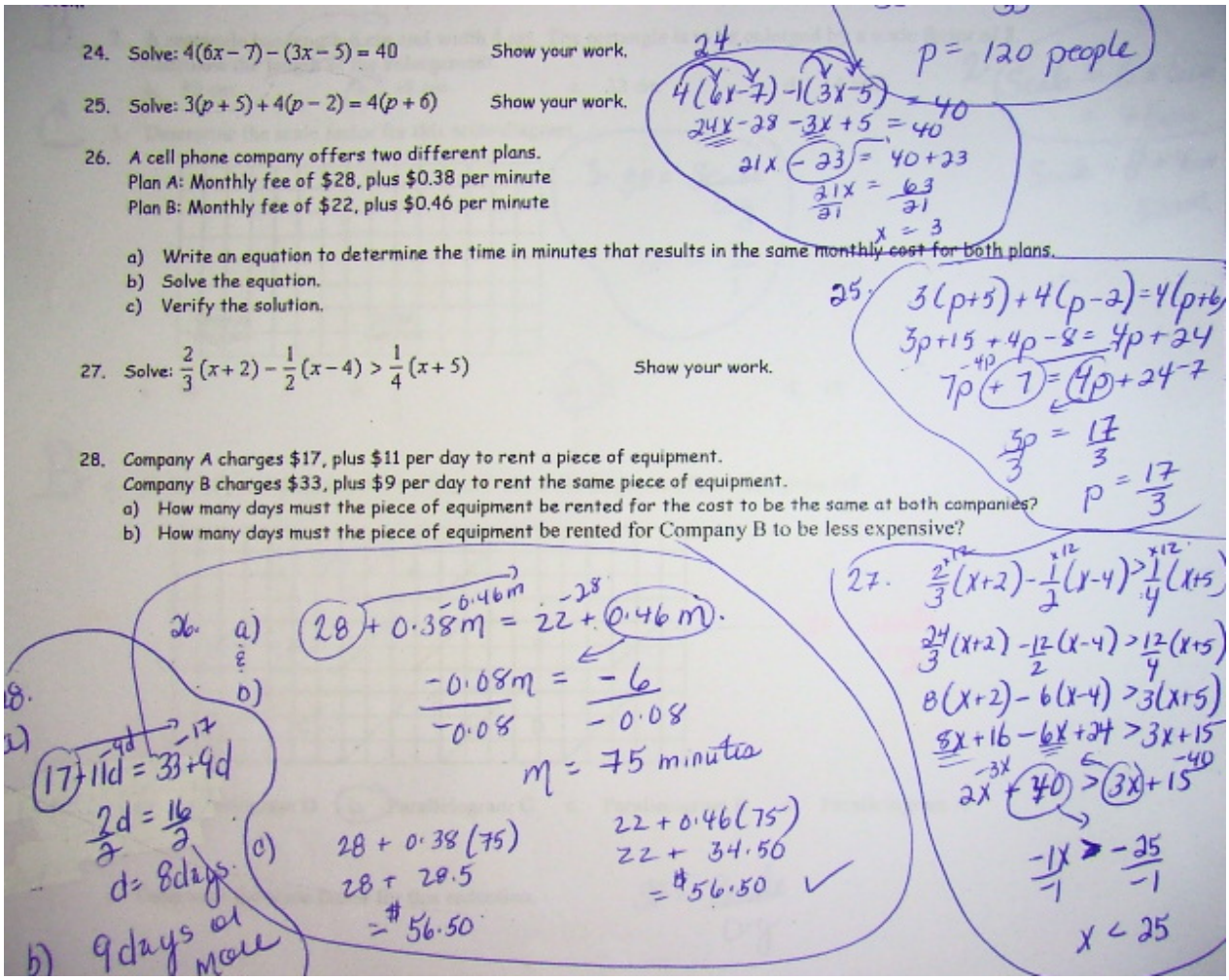
21. Solve and graph: $10.8 - 1.8b > 14.04$



22. A games room charges a $13 entrance fee, plus $2.35 per hour of play time. Anne-Marie has $29.45.
For how long can she play in the games room?
a) Choose a variable and write an inequality for this problem.
b) Solve the inequality.

23. The cost to rent a banquet hall is $500, plus $35 per person. A company's social committee has $4700 to put towards renting a banquet hall.
How many people could attend the function if they rented the banquet hall?
a) Choose a variable and write an inequality to solve the problem.
b) Solve the inequality.

Problem



24. Solve: $4(6x-7)-(3x-5)=40$ Show your work.

25. Solve: $3(p+5)+4(p-2)=4(p+6)$ Show your work.

26. A cell phone company offers two different plans.
Plan A: Monthly fee of \$28, plus \$0.38 per minute
Plan B: Monthly fee of \$22, plus \$0.46 per minute

a) Write an equation to determine the time in minutes that results in the same monthly cost for both plans.
b) Solve the equation.
c) Verify the solution.

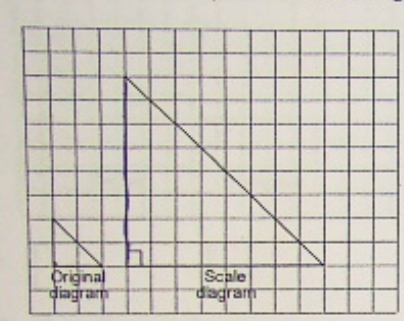
27. Solve: $\frac{2}{3}(x+2)-\frac{1}{2}(x-4)>\frac{1}{4}(x+5)$ Show your work.

28. Company A charges \$17, plus \$11 per day to rent a piece of equipment.
Company B charges \$33, plus \$9 per day to rent the same piece of equipment.
a) How many days must the piece of equipment be rented for the cost to be the same at both companies?
b) How many days must the piece of equipment be rented for Company B to be less expensive?

Review for Grade 9 Math Exam - Unit 7 - Similarity and Transformations

Multiple Choice *Identify the choice that best completes the statement or answers the question.*

C 1. Determine the scale factor for this scale diagram.



1. SF = Scale / Org.
SF = 8/2
SF = 4

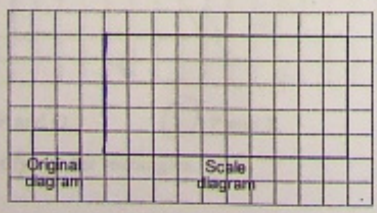
a. 32 b. 8 c. 4 d. $\frac{1}{4}$

B 2. A rectangle has length 6 cm and width 4 cm. The rectangle is to be enlarged by a scale factor of 8. Calculate the length of the enlargement.

a. 80 cm b. 48 cm c. 32 cm d. 14 cm

2. Scale = 8 x 6cm = 48cm
Scale = 8 x 4cm = 32cm

C 3. Determine the scale factor for this scale diagram.



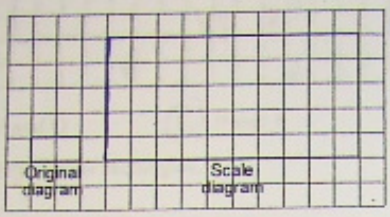
3. SF = Scale / Org.
SF = 5/1

a. 10 b. $\frac{1}{5}$ c. 5 d. 15

Calculate the length of the enlargement.

a. 80 cm (b.) 48 cm c. 32 cm d. 14 cm

C 3. Determine the scale factor for this scale diagram.

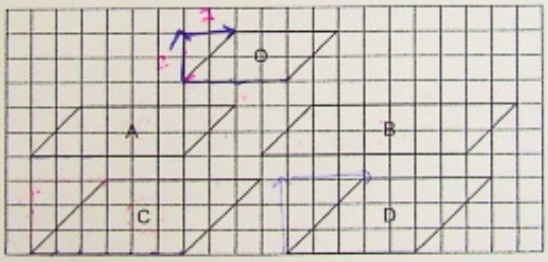


3. SF = Scale / Org.

SF = 5/1

a. 10 b. 1/5 (c.) 5 d. 15

B 4. Which of parallelograms A, B, C, and D are scale diagrams of parallelogram O?



SF = Scale / Org.

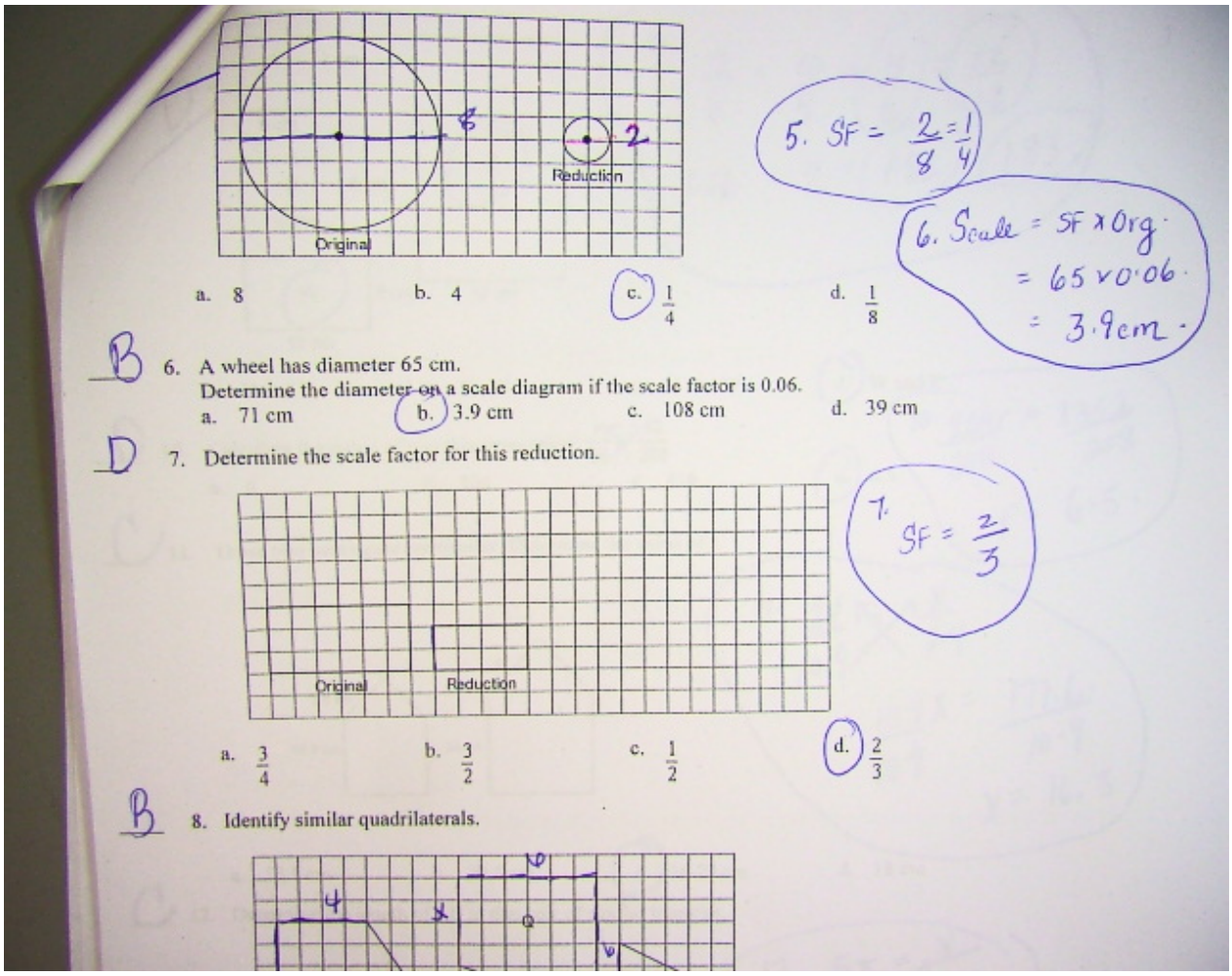
a. Parallelogram D (b.) Parallelogram C c. Parallelogram B d. Parallelogram A

___ 5. Determine the scale factor for this reduction.

SF = Scale / Org.

2. Scale = 8 = 4

Scale = 6 =



a. 8 b. 4 c. $\frac{1}{4}$ d. $\frac{1}{8}$

5. SF = $\frac{2}{8} = \frac{1}{4}$

6. Scale = SF x Org
= 65 x 0.06
= 3.9cm

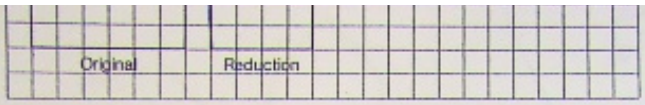
B 6. A wheel has diameter 65 cm.
Determine the diameter on a scale diagram if the scale factor is 0.06.
a. 71 cm b. 3.9 cm c. 108 cm d. 39 cm

D 7. Determine the scale factor for this reduction.

7. SF = $\frac{2}{3}$

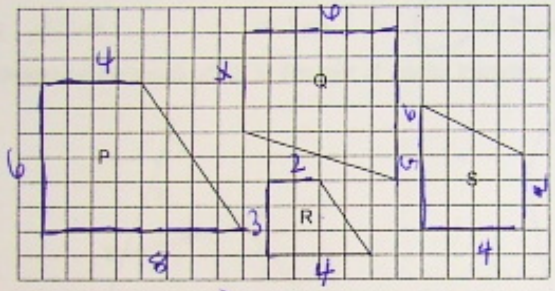
a. $\frac{3}{4}$ b. $\frac{3}{2}$ c. $\frac{1}{2}$ d. $\frac{2}{3}$

B 8. Identify similar quadrilaterals.



a. $\frac{3}{4}$ b. $\frac{3}{2}$ c. $\frac{1}{2}$ d. $\frac{2}{3}$

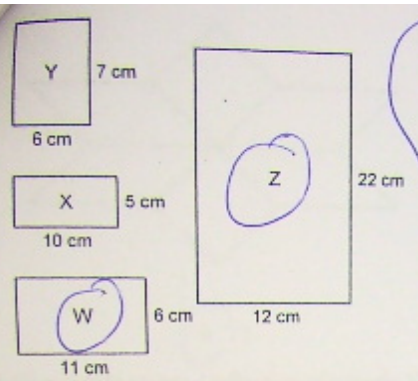
B 8. Identify similar quadrilaterals.



a. P and Q b. P and R c. R and S d. Q and S

D 9. Identify similar rectangles.

D



9. $\frac{7}{6} = \frac{10}{5} = \frac{11}{6} = \frac{22}{12}$

$1.16 = 2 = 1.83 = 1.83$

a. Y and Z b. X and Z c. Y and W d. W and Z

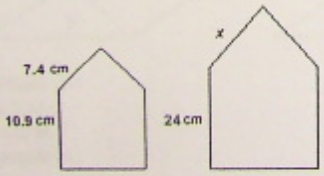
D 10. Calculate the value of r in this proportion: $\frac{r}{26} = \frac{52}{208}$

a. 6 b. 104 c. 416 d. 6.5

$10 \cdot \frac{208}{208} r = \frac{1352}{208}$

$r = 6.5$

C 11. These two pentagons are similar. Determine the value of x.



11. $\frac{24}{10.9} = \frac{x}{7.4}$

$\frac{10.9x}{10.9} = \frac{177.6}{10.9}$

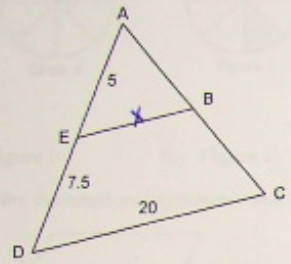
$x = 16.3$

a. 13.1 cm b. 20.5 cm c. 16.29 cm d. 18 cm

C 12. Determine the length of EB in this pair of similar triangles.

a. 13.1 cm b. 20.5 cm c. 16.29 cm d. 18 cm

C 12. Determine the length of EB in this pair of similar triangles.



12. $\frac{5}{12.5} = \frac{x}{20}$

$\frac{12.5x}{12.5} = \frac{100}{12.5}$

$x = 8$

a. 13.3 b. 10 c. 8 d. 5

B 13. When the shadow of a flagpole is 33.6 m long, a 1.8-m fencepost casts a shadow 2.8 m long. How tall is the flagpole?

a. 52.3 m b. 21.6 m c. 21.6 m d. 12.6 m

13. $\frac{\text{Object}}{\text{Shadow}}$

$\frac{x}{33.6} = \frac{1.8}{2.8}$

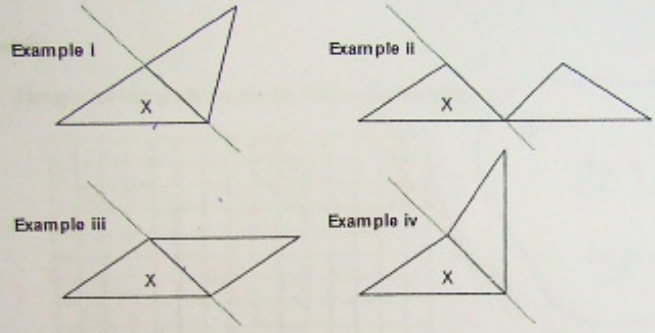
$\frac{2.8x}{2.8} = \frac{60.48}{2.8}$

$x = 21.6$

B 14. How many lines of symmetry does this tessellation have?

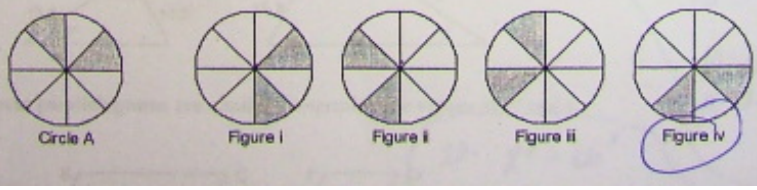
a. 6 b. 2 c. 4 d. 1

D 15. Which example shows a reflection of triangle X in the dotted line?



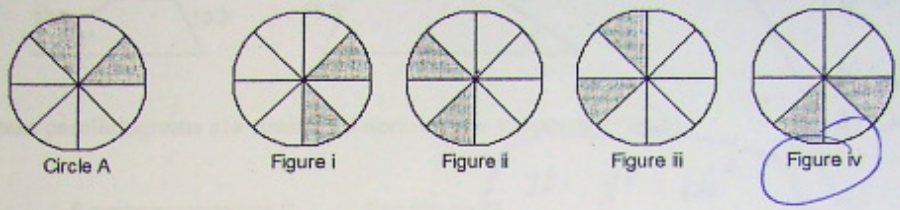
a. Example iii
b. Example i
c. Example ii
d. Example iv

A 16. Which figure shows the rotation image of circle A after a 135° counterclockwise rotation about its centre?



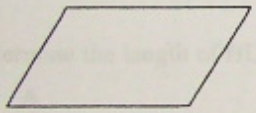
d. Example iv

A 16. Which figure shows the rotation image of circle A after a 135° counterclockwise rotation about its cer



a. Figure iv b. Figure i c. Figure iii d. Figure ii

A 17. Describe the rotational symmetry and line symmetry of this parallelogram.

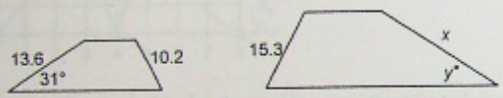


a. Rotational symmetry of order 2 about the centre; no line symmetry
b. Rotational symmetry of order 2 about the centre; 1 line of symmetry through the centre
c. Rotational symmetry of order 1 about the centre; 1 line of symmetry through the centre
d. No rotational symmetry; no line symmetry

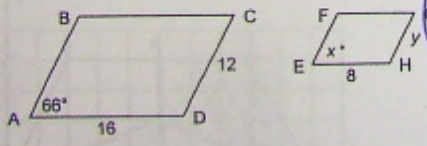
Short Answer

18. Determine the scale factor for this scale drawing.

19. These quadrilaterals are similar. Determine the values of x and $y°$.



20. These parallelograms are similar. Determine the values of $x°$ and y.



21. Determine the length of BD in these similar triangles.

19. SF = $\frac{7}{2}$ or SF = 3.5

19. $y° = 31°$

$\frac{10.2}{15.3} = \frac{13.6}{x}$

$\frac{10.2x}{10.2} = \frac{208.08}{10.2}$

$x = 20.4$

20. $x° = 66°$

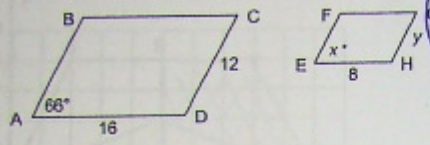
$\frac{16}{8} = \frac{12}{y}$

$\frac{16y}{16} = \frac{96}{16}$

$y = 6$.

21. $5 = x$

20. These parallelograms are similar. Determine the values of $x°$ and y.



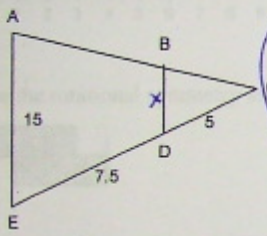
20. $x° = 66°$

$\frac{16}{8} = \frac{12}{y}$

$\frac{16y}{16} = \frac{96}{16}$

$y = 6$

21. Determine the length of BD in these similar triangles.

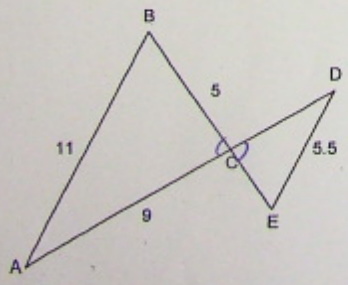


21. $\frac{5}{12.5} = \frac{x}{15}$

$\frac{12.5x}{12.5} = \frac{75}{12.5}$

$x = 6$

22. Determine the lengths of CD and CE in these similar triangles.



22. $\frac{5}{x} = \frac{11}{5.5}$

$\frac{11x}{11} = \frac{27.5}{11}$

$x = 2.5$

hen the shadow of an electrical tower is 11.7 m long, a 4.5-m lamp post casts a shadow 6.5 m long. How tall is the electrical tower?

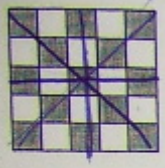
23. object / shadow

$\frac{x}{11.7} = \frac{4.5}{6.5}$

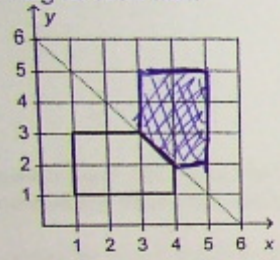
$\frac{6.5x}{6.5} = \frac{52.65}{6.5}$

$x = 8.1\text{ m}$

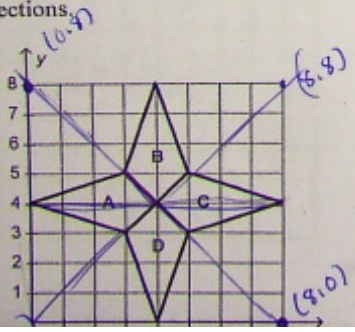
4. Draw the lines of symmetry in this tessellation.



25. This polygon is one-half of a shape. Use the dotted line as a line of symmetry to complete the shape by drawing its other half.



26. This design was created by reflecting quadrilateral A to create quadrilaterals B, C, and D. Describe the reflections.

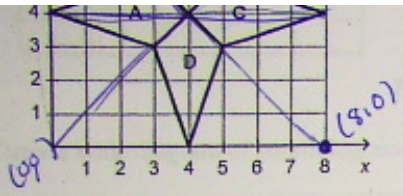


⇒ Vertical Reflection at $x = 4$

⇒ Oblique at $(0,8)$ & $(8,0)$

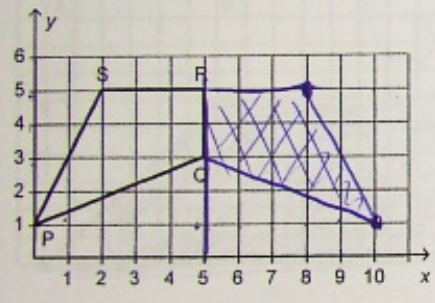
⇒ Oblique at $(0,0)$ & $(8,8)$

⇒ Horizontal Reflection at $y = 4$



=> Horizontal Reflection at y

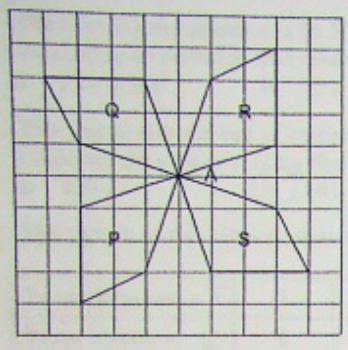
27. This polygon is one-half of a shape. Use a vertical line through 5 on the x-axis as a line of symmetry to complete the shape by drawing its other half. Write the coordinates of the larger shape formed by PQRS and its image.



28. Describe the rotational symmetry and line symmetry of this diagram.

There is no line of symmetry.

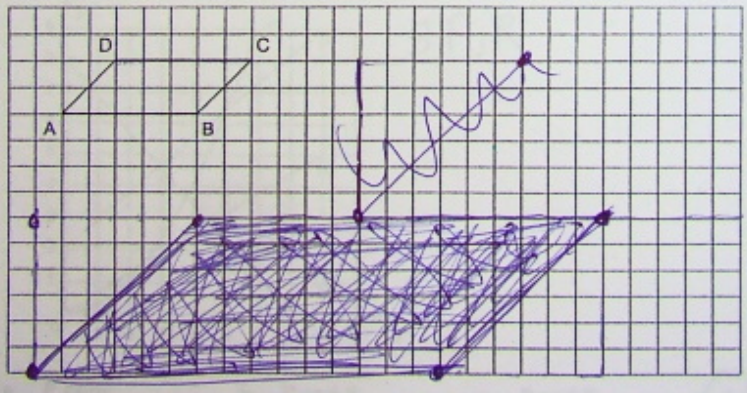
29. Quadrilateral P is rotated 90° clockwise about vertex A, then 270° counterclockwise about vertex A. Which quadrilateral shows the final position of quadrilateral P?



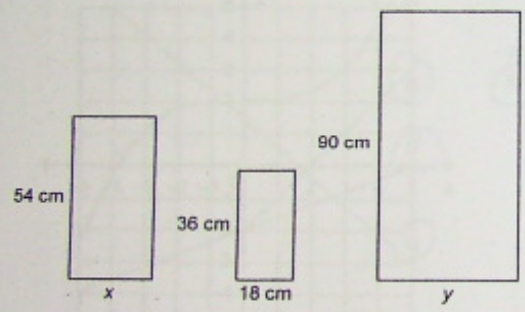
R

Problem

30. Draw a scale diagram of parallelogram ABCD with scale factor 3.



31. These three rectangles are similar.
    a) Determine the values of x and y.
    b) Griswald draws another similar rectangle with width 57.6 cm. What is its length?



(a) $\frac{54}{x} = \frac{36}{18}$

$\frac{36x}{36} = \frac{972}{36}$

$x = 27\text{cm}$

$\frac{36}{18} = \frac{90}{y}$

$\frac{36y}{36} = \frac{1620}{36}$

$y = 45\text{cm}$

(b) $\frac{36}{18} = \frac{x}{57.6}$

$\frac{18x}{18} = \frac{2073.6}{18}$

$x = 115.2\text{cm}$