St. Francis Catholic High School

Algebra 1/Geometry Curriculum Review Problems

1) $3x^2(x^2 - 4xy + y) =$ (A) $-12x^5y^2$ (B) $3x^4 - 24x^3y$

(C) $3x^4 - 4xy + y$ (D) $3x^4 + 12x^3y + 3x^2y$ (E) $3x^4 - 12x^3y + 3x^2y$

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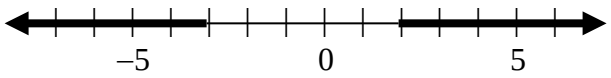
2) Find the compound inequality that represents this graph.



(A) $x > -3$ or $x < 2$ (B) $-3 < x < 2$ (C) $x < -3$ and $x > 2$

(D) $-3 \leq x \leq 2$ (E) $x < -3$ or $x > 2$

---

3) $(2x^4y^2)^3 =$

(A) $6x^7y^5$ (B) $6x^{12}y^6$ (C) $8x^7y^5$ (D) $8x^{12}y^6$ (E) $8x^{12}y^5$

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4) If $3x + 6 = 0$, what is the value of $x + 7$?

(A) –11 (B) –9 (C) –2 (D) 5 (E) 9

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5) $(y^2 - 6y + 2) - (3y^2 + 7y - 1) =$ (A) $-2y^2 + y + 1$ (B) $-2y^2 - 13y + 1$

(C) $-2y^2 - y + 3$ (D) $-2y^2 + y - 3$ (E) $-2y^2 - 13y + 3$

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6) $\dfrac{(x^2y^3)^5}{x^7y^9} =$

(A) x^3y^6 (B) $x^{17}y^{24}$ (C) x^0y^{-1} (D) x^3y^{17} (E) $x^{14}y^6$

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7) One solution of $(x - 5)(3x + 4) = 0$ is

(A) -5 (B) $-\frac{4}{3}$ (C) $-\frac{3}{4}$ (D) $\frac{4}{3}$ (E) $\frac{3}{4}$

8) One factor of $3x^2 - x - 2$ is

(A) $x + 1$ (B) $3x - 2$ (C) $x - 2$ (D) $3x + 1$ (E) $3x + 2$

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9) If $\left\{\begin{matrix} x + 2y = 5 \\ 3x - 2y = 7 \end{matrix}\right\}$, then $x =$

(A) 12 (B) 3 (C) 8 (D) 4 (E) 16

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10) $\sqrt{48} - \sqrt{12} =$

(A) 2 (B) $\sqrt{3}$ (C) $2\sqrt{3}$ (D) $4\sqrt{3}$ (E) 6

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11) Factor completely: $3x^2 - 75$

(A) $3(x^2 - 25)$ (B) $(x + 5)(x - 5)$ (C) $(3x + 5)(x - 5)$ (E) $3(x + 5)(x - 5)$

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12) $\frac{x^2 - 9}{x + 2} \div \frac{x^2 + x - 6}{x^2 - 4} =$

(A) x – 3 (B) x + 3 (C) x + 2 (D) x – 2 (E) 1

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13) If $\frac{3}{x - 1} = 2$, then $x =$

(A) $\frac{3}{5}$ (B) $\frac{5}{3}$ (C) 2 (D) $\frac{5}{2}$ (E) 3

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14) $\frac{x^{-5}y^9}{\left(x^{-2}y^2\right)^{-3}} =$

(A) $\frac{x^{11}}{y^{15}}$ (B) $\frac{y^3}{x}$ (C) xy^3 (D) $\frac{y^{15}}{x^{11}}$ (E) $\frac{y^{15}}{x}$

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15) If $\boldsymbol{y} = 3\boldsymbol{x}$ and $4\boldsymbol{x} - 2\boldsymbol{y} = 5$, then $\boldsymbol{x}$ =

(A) $-\frac{15}{2}$ (B) $-\frac{5}{2}$ (C) $\frac{11}{6}$ (D) $\frac{5}{2}$ (E) $\frac{15}{2}$

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16) Find the common denominator of: $\frac{3}{2x-4} + \frac{x}{x+2}$

(A) $2(\boldsymbol{x} + 2)(\boldsymbol{x} - 2)$ (B) $(\boldsymbol{x} + 2)(\boldsymbol{x} - 2)$ (C) $2\boldsymbol{x} - 4$ (D) $\boldsymbol{x} - 2$

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17) Rationalize the denominator (reduce fraction to lowest terms): $\sqrt{\frac{7}{8}}$

(A) $\frac{\sqrt{120}}{8}$ (B) $\sqrt{\frac{14}{16}}$ (C) $\frac{\sqrt{14}}{4}$ (D) $\sqrt{\frac{120}{64}}$ (E) $\frac{\sqrt{14}}{8}$

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18) Solve: $\frac{x^2}{x-5} + \frac{25}{5-x} = -2$

(A) {–7, 5} (B) {7, –5} (C) {7} (D) {–7} (E) no solution

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19) If point A(3, 1) and B(2, –3), what is the slope of line AB?

(A) 4 (B) –4 (C) $\frac{1}{4}$ (D) $-\frac{1}{4}$ (E) undefined

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20) Factor: $2\boldsymbol{ac} + \boldsymbol{ad} + 6\boldsymbol{bc} + 3\boldsymbol{bd}$ (A) $(2\boldsymbol{c} + \boldsymbol{d})(\boldsymbol{a} + 3\boldsymbol{b})$

(B) $2\boldsymbol{a}(\boldsymbol{c}) + \boldsymbol{d}(\boldsymbol{a} + 3\boldsymbol{b}) + \boldsymbol{b}$ (C) $2\boldsymbol{ac} + \boldsymbol{ad} + 6\boldsymbol{cd} + 3d^2$ (D) $5\boldsymbol{abcd}$

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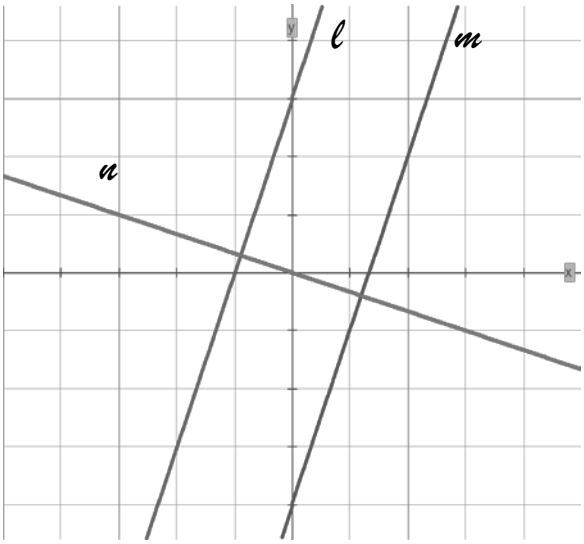
21) Which equation is parallel to $\boldsymbol{y} = 3\boldsymbol{x}$?

(A) $\boldsymbol{y} - 3\boldsymbol{x} = 2$ (B) $3\boldsymbol{x} + \boldsymbol{y} = 0$ (C) $3\boldsymbol{y} = \boldsymbol{x}$ (D) $3\boldsymbol{y} - \boldsymbol{x} = 2$

22) Divide using long division: $(6x^2 - x - 4) \div (2x + 1)$

(A) $3x - 2 - \frac{2}{2x+1}$ (B) $3x + 1 - \frac{3}{2x+1}$ (C) $3x - 2$ (D) $3x - 2 - \frac{6}{2x+1}$

For problems #23 – 25, use the graph below.



23) The equation for line ℓ is:

(A) $y = 3x - 4$ (B) $y = 3x + 3$

(C) $y = 3x$ (D) $y = 3x - 1$

24) The equation for line n is:

(A) $y = -\frac{1}{3}x$ (B) $y = -\frac{1}{3}x + 3$

(C) $-\frac{1}{3}x + y = 0$ (D) $-\frac{1}{3}x - y = 2$

25) Which statement is true for lines ℓ, m, and n ?

(A) ℓ is perpendicular to m (B) ℓ is parallel to n

(C) m is parallel to n (D) ℓ is parallel to m

26) Solve: $n^3 + 2n^2 - 35n = 0$

(A) {–7, 0, 5} (B) {–5, 0, 7} (C) {–5, 7} (D) {–7, 5}

27) Factor completely: $6x^2 + 20x - 16$ (A) $(x + 4)(6x - 4)$

(B) $(2x + 4)(3x + 4)$ (C) $2(3x - 2)(x + 4)$ (D) $2(3x + 4)(x + 2)$

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28) Solve: $x^2 - 8x + 11 = 0$

(A) $8 \pm \sqrt{5}$ (B) $4 \pm 2\sqrt{5}$ (C) $8 \pm 2\sqrt{5}$ (D) $4 \pm \sqrt{5}$ (E) $-4 \pm \sqrt{5}$

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29) If y varies directly as x and $y = 28$ and $x = 18$, find y when $x = 9$.

(A) 56 (B) 14 (C) 18 (D) 28 (E) 9

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30) Simplify: $5\sqrt{8}\ (2\sqrt{18} + 3\sqrt{10})$

(A) $120 + \sqrt{5}$ (B) $120 + 6\sqrt{5}$ (C) $120 + 60\sqrt{5}$ (D) $120 + 15\sqrt{5}$

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31) For $\frac{a + bt}{c} = m$, solve for t.

(A) $\frac{cm - a}{b}$ (B) $\frac{cm + a}{b}$ (C) $\frac{cm - b}{a}$ (D) $\frac{cm}{b} - a$

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32) If $f(x) = x^2 - 3x + 5$, find $f(a + 2)$

(A) $a^2 + a - 3$ (B) $a^2 - 3a + 3$ (C) $a^2 + a + 9$ (D) $a^2 + a + 3$

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33) Simplify: $\sqrt{45x^{16}y^7}$

(A) $9x^6y^3\sqrt{5y}$ (B) $3x^8y^3\sqrt{5y}$ (C) $9x^4y^3\sqrt{5y}$ (D) $9x^6y^3\sqrt{5}$

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34) Solve: $|x + 3| = 5$

(A) {2} (B) {−8} (C) {2, 8} (D) {−2, 8} (E) {2, −8}

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35) Solve: $\sqrt{8x+1}-5=0$

(A) 25 (B) 24 (C) 3 (D) 26 (E) 5

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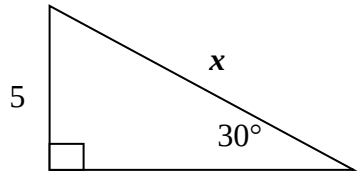
36) Find ***x***.



(A) 30 (B) 60

(C) 5 (D) 10

(E) not enough information

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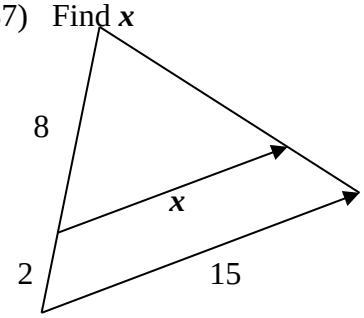
37) Find ***x***



(A) 60 (B) 12

(C) 9 (D) 5

(E) not enough information

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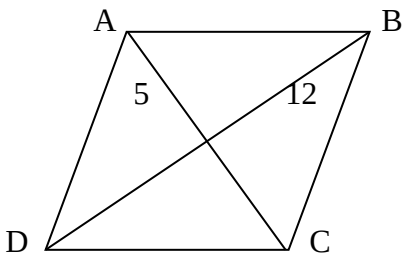
38) ABCD is a rhombus. Find its perimeter.

(A) 48 (B) 20

(C) 68 (D) 52

(E) not enough information



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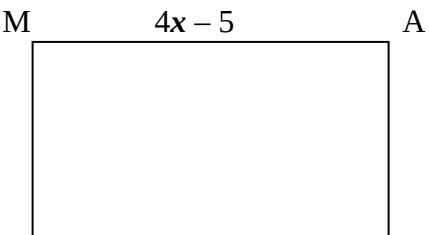
39) MATH is a rectangle. Find ***x***



(A) 19 (B) 6

8

(C) 24 (D) 8

(E) not enough information

H 19 T

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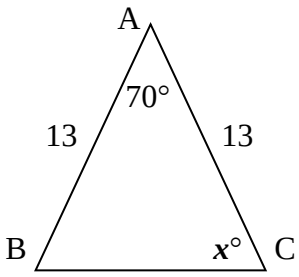
40) ABC is an isosceles triangle. Find ***x***

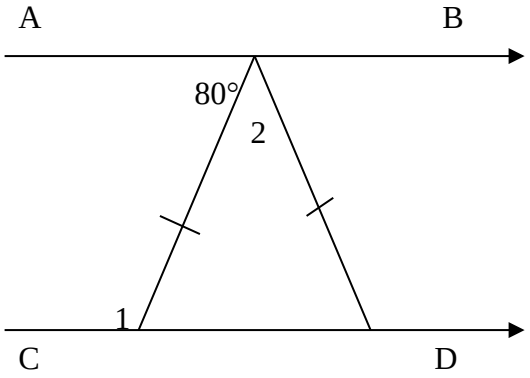


(A) 110° (B) 70°

(C) 180° (D) 55°

(E) not enough information

For problems #41 – 42, use the diagram: AB || CD



41) Find the measure of angle 1.

(A) 100° (B) 80°

(C) 20° (D) 160°

42) Find the measure of angle 2.

(A) 100° (B) 80°

(C) 20° (D) 160°

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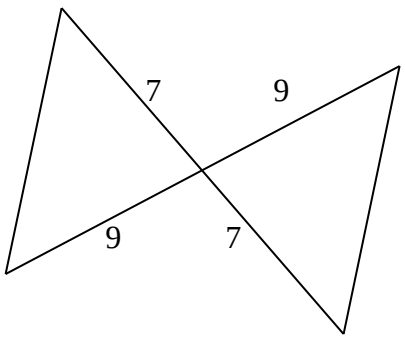
43) What congruence postulate could be used to prove that the 2 triangles are congruent?



(A) AAS (B) ASA

(C) SSS (D) SAS

(E) the triangles are not congruent

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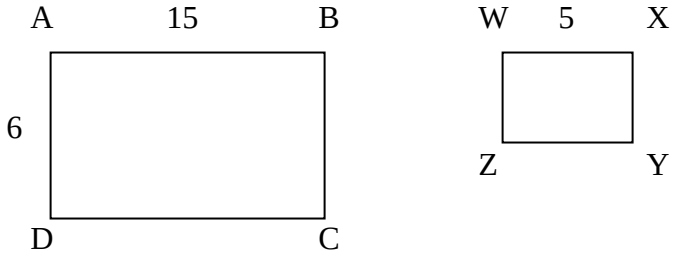
44) ABCD ~ WXYZ and are similar rectangles. Find the perimeter of WXYZ.



(A) 42 (B) 14 (C) 21 (D) 30 (E) not enough information

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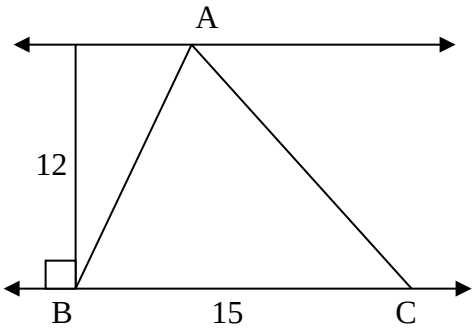
45) Find the area of triangle ABC.



(A) 180 (B) 225

(C) 144 (D) 90

(E) not enough information

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46) Find the geometric mean between 6 and 18.

(A) 108 (B) $6\sqrt{3}$ (C) $9\sqrt{3}$ (D) $6\sqrt{2}$ (E) $36\sqrt{3}$

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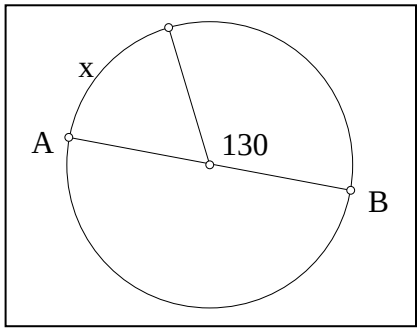
47) Find ***x***, AB is the diameter.

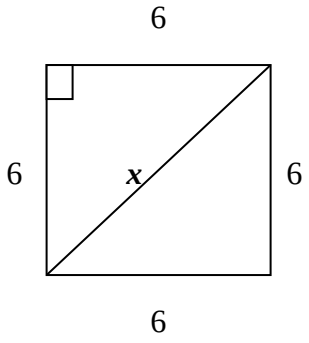


(A) 130° (B) 180°

(C) 50° (D) 360°

(E) not enough information

48) Find x



(A) 24 (B) $6\sqrt{2}$

(C) 36 (D) 72

(E) not enough information

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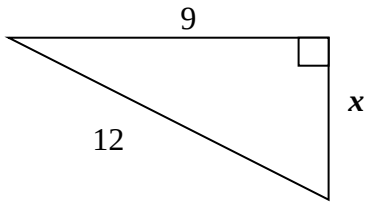
49) Find x



(A) $3\sqrt{7}$ (B) 63

(C) $9\sqrt{7}$ (D) $3\sqrt{6}$

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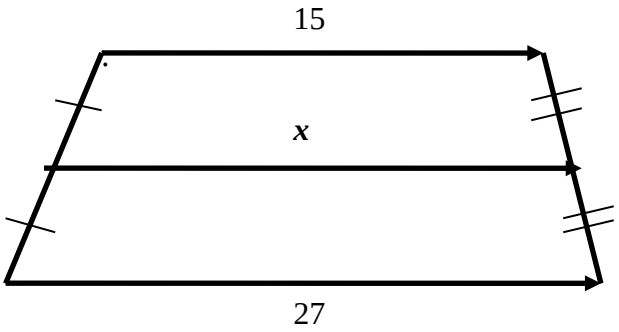
50) Find x.



(A) 34 (B) 17

(C) 21 (D) 16

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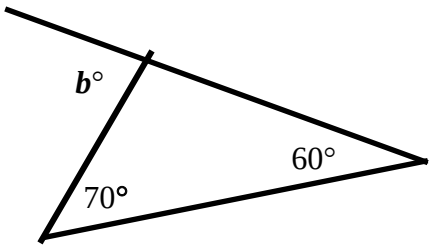
51) Find the degree measure of angle b.



(A) 50° (B) 130°

(C) 135° (D) 140°

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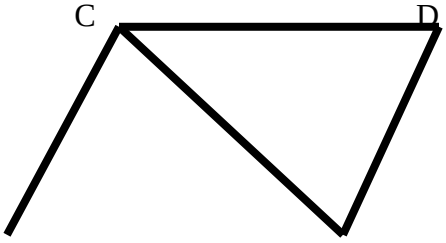
52) In parallelogram ACDB, angle ABD = 112° and angle ABC = 47°. What is the measure angle ACB?



(A) 68° (B) 45°

(C) 47° (D) 65°

A B

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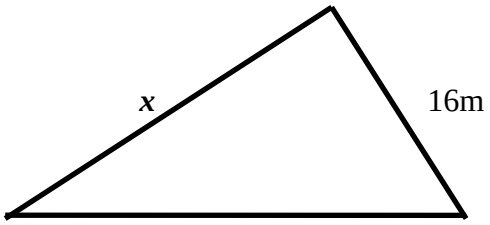
53) In this triangle, the length of x must be ___ < x < ___.



(A) 4m, 36m (B) 36m, 4m

(C) 5m, 35m (D) 35m, 5m

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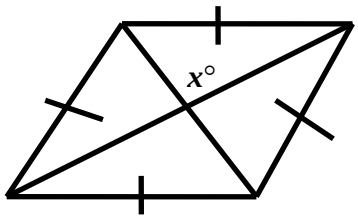
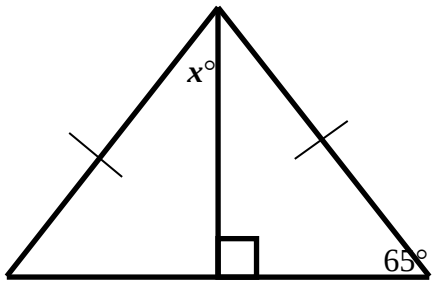
54) Find angle x.



(A) 30° (B) 60°

(C) 90° (D) 120°

55) Find angle x.



(A) 10° (B) 25°

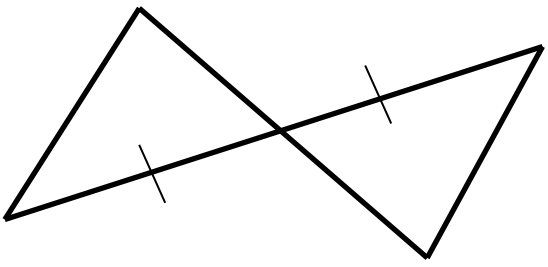
(C) 40° (D) 80°

For problems **#56 – 59**, state how the triangles can be proven congruent. If none, state so.

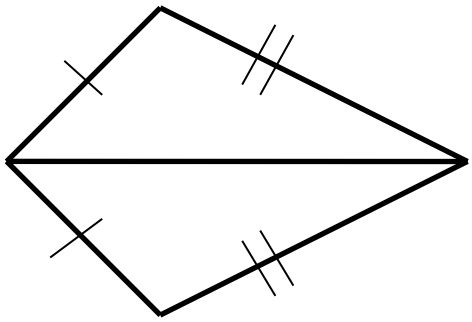
Mark **(A)** SAS for $\cong \Delta$s **(B)** SSS for $\cong \Delta$s **(C)** ASA for $\cong \Delta$s

(D) HL for $\cong \Delta$s **(E)** none

56)



57)



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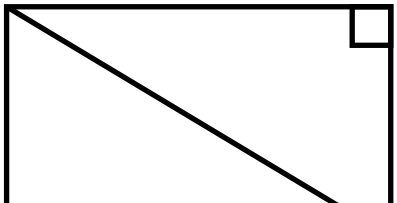
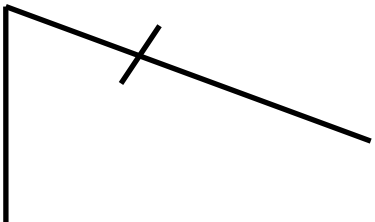
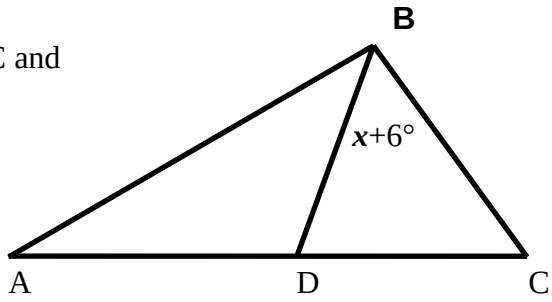
58)



59)



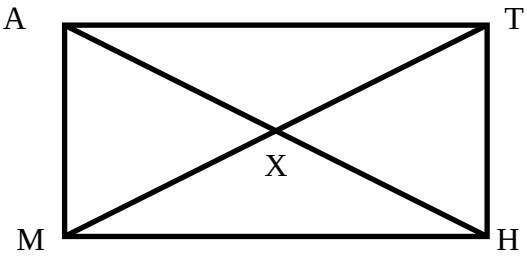
60) Find x if BD is an angle bisector of $\angle ABC$ and $m\angle ABC = 4x - 6$



(A) 9 (B) 3

(C) 15 (D) 6

61) Find MT if $MX = 4x + 5$ and $XT = 2x + 11$ MATH is a rectangle.



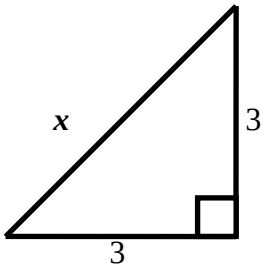
(A) 3 (B) 17

(C) 34 (D) 8

62) Suppose polygon **P** is similar to polygon **Q**, and that the ratio of similarity of **Q** to **P** is 3. If **P** has a perimeter of 15 m, what is the perimeter of **Q**?

(A) 45 m (B) 5 m (C) 9 m (D) 27 m

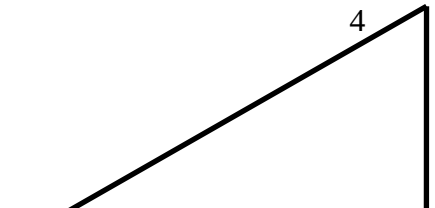
63) Find x.



(A) 3 uts (B) $3\sqrt{2}$ uts

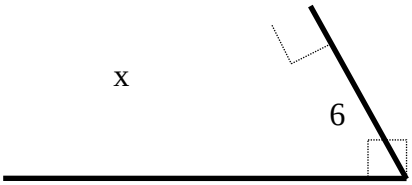
(C) 6 uts (D) $\frac{3\sqrt{2}}{2}$ uts

64) Find x.



(A) 9 ft (B) $6\sqrt{3}$ ft

(C) 12 ft (D) $12\sqrt{3}$ ft



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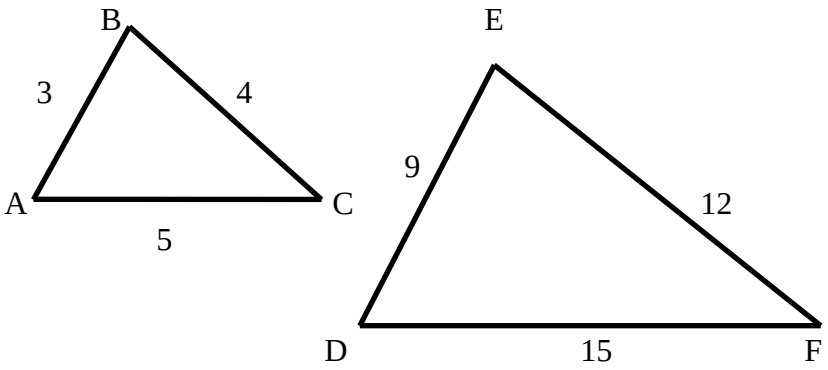
65) Find the ratio of similarity of ΔABC to ΔDEF.

(A) 3

(B) 1:3

(C) 4:9

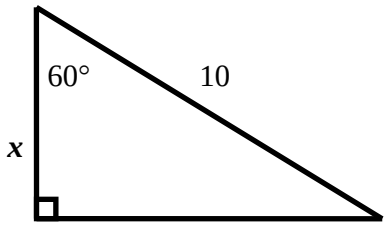
(D) 1:5



66) Find ***x***.

(A) 5 (B) 10

(C) 15 (D) 20



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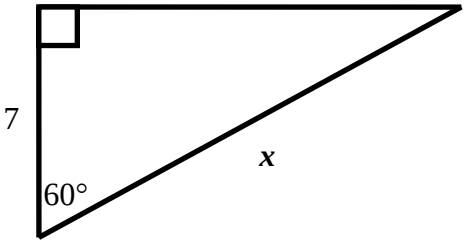
67) Find ***x***.

(A) 14 (B) 7

(C) 3.5 (D) 60



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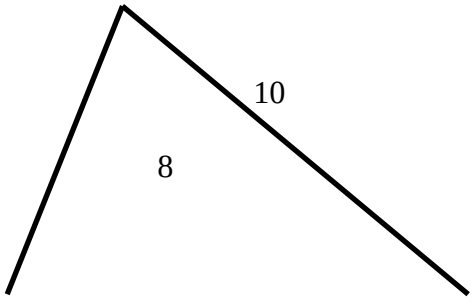
68) Find ***x***.

(A) 12.8 (B) 4.8

(C) 16 (D) 6.8



6

x

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69) Find the geometric mean between 8 and 18.

(A) 8 (B) 18 (C) 13 (D) 12

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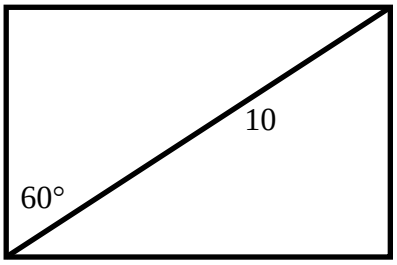
70) Find the perimeter of the rectangle.



(A) $5 + 5\sqrt{3}$ (B) $10\sqrt{3}$

(C) $10 + 10\sqrt{3}$ (D) $20\sqrt{3}$

Answers:

1E	15B	29B	43D	57B
2E	16A	30C	44B	58D
3D	17C	31A	45D	59D
4D	18D	32D	46B	60A
5E	19A	33B	47C	61C
6A	20A	34E	48B	62A
7B	21A	35C	49A	63B
8E	22A	36D	50C	64A
9B	23B	37B	51B	65B
10C	24A	38D	52D	66A
11E	25D	39B	53A	67A
12A	26A	40D	54C	68A
13D	27C	41A	55B	69D
14D	28D	42C	56E	70C

1. Factor completely:
   a. $12x^2 - 75$
   b. $6y^2 - 19y + 10$
   c. $6x^2 + 20x - 16$
   d. $4x^3 - 36x$

2. Solve equations and inequalities:
   a. $4x - (6 - x) = 24\left(\frac{x}{3} - \frac{7}{4}\right)$
   b. $\frac{1}{4}(16x - 4) = \frac{1}{5}(25 - 15x)$
   c. $2|x + 4| + 26 = 48$
   d. $\frac{x-3}{5} = \frac{7-x}{3}$
   e. $3x + 1 < 7$ OR $2x - 9 > 7$
   f. $9 < 3x + 6 < 15$
   g. $|3x - 2| = -4$
   h. $|2x + 5| + 4 = 15$

3. Graph the solution on a number line:
   a. $-2x > 8$
   b. $-5 \le x \le 7$
   c. $x + 3 \ge 15 - 2x$
   d. $-9 \le 2x + 3 \le 13$

4. Solve the quadratic equation:
   a. $6x^2 + 6 = -13x$
   b. $(x + 4)(x - 2) = -5$
   c. $x^2 - 3 = -5x$
   d. $4x^2 + 8x = -3$
   e. $3x^2 = 12$
   f. $4x^2 - 25 = 0$

5. Simplify radicals (answers must contain simplified radicals):
   a. $9\sqrt{50} - 4\sqrt{2} - 5\sqrt{8}$
   b. $\frac{4\sqrt{5}}{3\sqrt{2}}$
   c. $\frac{14 + 6\sqrt{2}}{2\sqrt{3}}$
   d. $\sqrt{2}(3\sqrt{10} - 2\sqrt{2})$

6. Simplify expressions:

   a. $\frac{2}{3}(3x-12y+6z) - \frac{3}{5}(15x-10y-5z)$

   b. $(3x-5)^2$

   c. $(x-5)(x^2+5x+25)$

   d. $\frac{y^2+10y+25}{y^2-9} \times \frac{y^2+3y}{y+5}$

7. Simplify exponentials:

   a. $\frac{(-2x^{-2}y^3)^{-6}}{(4^{-1}x^3y^{-2})^7}$

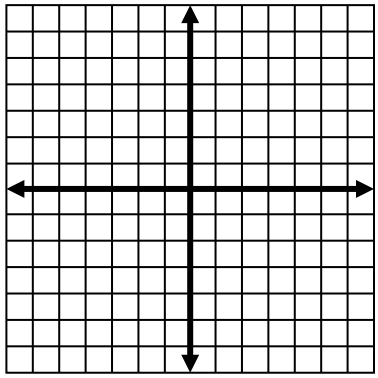
   b. $\frac{(4x^2y^3)^{11}}{(8x^3y^4)^7}$

   c. $\left(\frac{24x^{-5}y^3}{30x^{-12}y^{-2}}\right)^6 \times \left(\frac{16x^7y^{-3}}{25x^{-3}y}\right)^{-3}$

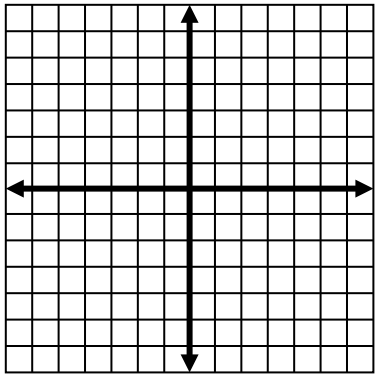
   d. $(2x^4y^{-2})^3\ (x^{-5}y^3)^{-2}$

8. Graph on a coordinate system:

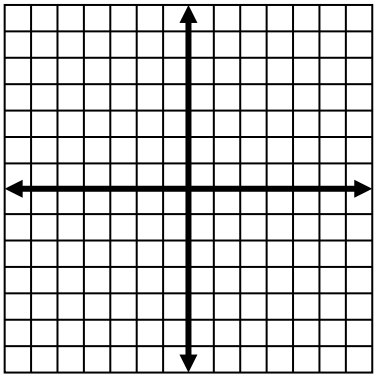
a. $y = -\frac{3}{4}x + 3$



b. $2x + 3y = 6$



c. $y > 3x - 4$



9. Solve systems of equations:

a.
$$\begin{aligned} 3x - 4y &= 13 \\ 2x + y &= 5 \end{aligned}$$

b. A collection of dimes and quarters totals \$5.45. There are 32 coins in all. How many dimes and quarters are there?

10. Write equations of lines:

a. Given 2 points, find the equation in **point-slope form** [$y - y_1 = m(x - x_1)$] and then into **slope-intercept form** ($y = mx + b$).

i. A(2, 4) and B(3, – 1)
ii. C(– 4, 2) and D(– 2, 5)
iii. E(5, – 3) and F(2, 1)

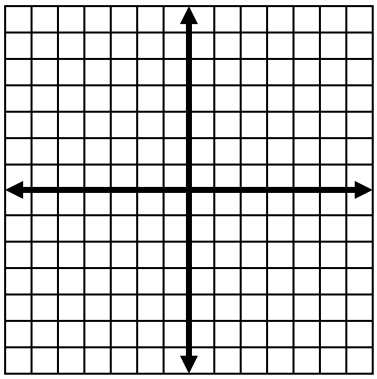
b. Find an equation that is **perpendicular** to the given line through a point.

i. $y = -\frac{3}{2}x + 2$; (6, 4)
ii. $y = 3x - 5$; (– 3, 2)
iii. $y = \frac{5}{2}x + 1$; (– 10, – 3)

11. Solve systems of inequalities:

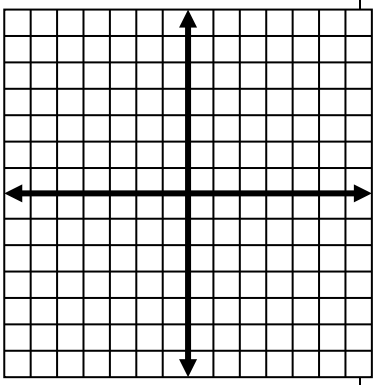
a. $y < -2x + 4$

$y > 3x - 4$



b. $2x - y \le 4$

$x + 3y \le 12$



Answers:

1a) $3(2x-5)(2x+5)$

b) $(3y-2)(2y-5)$

c) $2(3x-2)(x+4)$

d) $4x(x-3)(x+3)$

2a) 12

b) $6/7$

c) $-15,\ 7$

2d) $11/2$

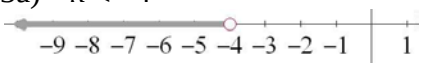
e) $x < 2$ or $x > 8$

f) $1 < x < 3$

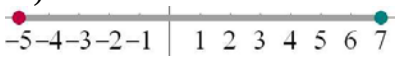
g) no solution

h) $x = -8$ or $x = 3$

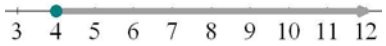
3a) $x < -4$



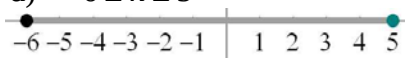
3b) $-5 \le x \le 7$



c) $x \ge 4$



d) $-6 \le x \le 5$



4a) $x = -\frac{2}{3},\ -\frac{3}{2}$

b) $x = -3,\ 1$

c) $x = \frac{-5 \pm \sqrt{37}}{2}$

d) $x = -\frac{1}{2},\ -\frac{3}{2}$

e) $x = \pm 2$

f) $x = \pm\frac{5}{2}$

5a) $31\sqrt{2}$

b) $\frac{2\sqrt{10}}{3}$

c) $\frac{7\sqrt{3} + 3\sqrt{6}}{3}$

d) $6\sqrt{5} - 4$

6a) $-7x - 2y + 7z$

b) $9x^2 - 30x + 25$

c) $x^3 - 125$

d) $\frac{y(y+5)}{y-3}$

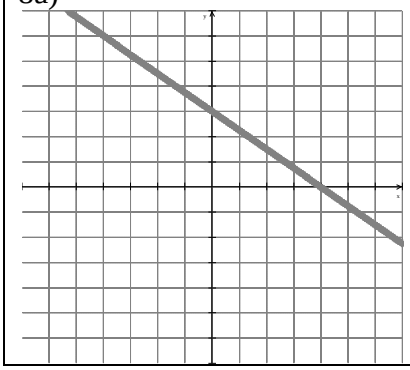
7a) $\frac{256}{x^9 y^4}$

b) $2xy^5$

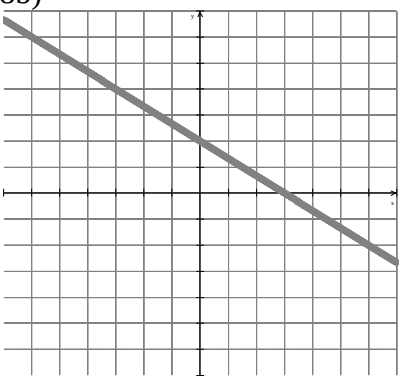
c) $x^{12} y^{42}$

d) $\frac{8x^{22}}{y^{12}}$

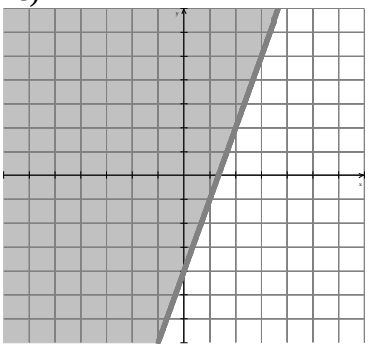
8a)



8b)



c)



9a) $(x,\ y) = (3,\ -1)$

b) dimes = 17

quarters = 15

10a) i) $y - 4 = -5(x - 2)$

$y = -5x + 14$

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

$y = \frac{3}{2}x + 8$

iii) $y + 3 = -\frac{4}{3}(x - 5)$

$y = -\frac{4}{3}x + \frac{11}{3}$

10b) i) $y - 4 = \frac{2}{3}(x - 6)$

$y = \frac{2}{3}x$

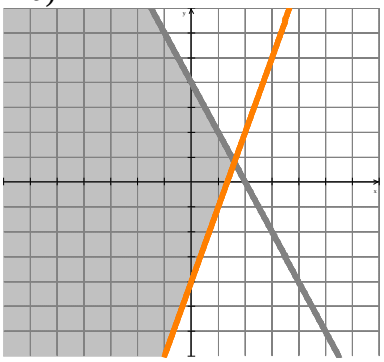
10b) ii) $y - 2 = -\frac{1}{3}(x + 3)$

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

iii) $y + 3 = -\frac{2}{5}(x + 10)$

$y = -\frac{2}{5}x - 7$

11a)



11b)