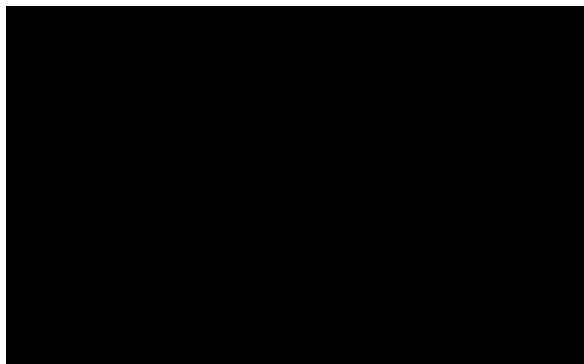


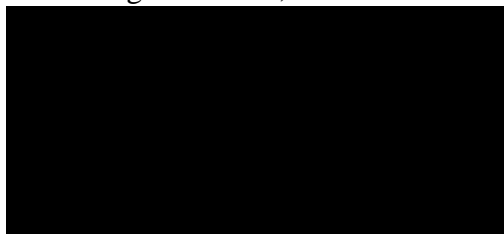
1. In the diagram of  $ABC$  below,  $DE$  is parallel to  $AC$ ,  $CD = 15$ ,  $AD = 9$ , and  $AB = 40$ .



The length of  $DE$  is

- (1) 25              (2) 24              (3) 15              (4) 30

2. In the diagram below,  $AD$  intersects  $BC$  at  $C$ , and



If  $CD = 6.6$  cm,  $DE = 3.4$  cm,  $CE = 4.2$  cm, and  $BC = 5.25$  cm, what is the length of  $AD$ , to the nearest hundredth of a centimeter?

- (1) 8.25              (2) 5.28              (3) 3.34              (4) 2.70

3. Given  $MRO$  shown below, with trapezoid  $PTRO$ ,  $MR = 9$ ,  $MP = 2$ , and  $PO = 4$ .



What is the length of  $PT$ ?

- (1) 4.5              (2) 6              (3) 3              (4) 5

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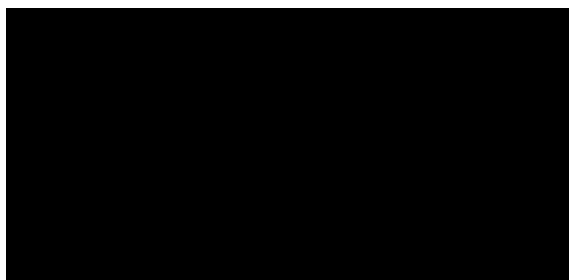
4. As shown in the diagram below,      and      intersect at  $E$ , and      .



Given      , which equation is true?

- (1)      (2)      (3)      (4)

5. In the diagram below,



Which measurements are justified by this similarity?

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

6. A 20-foot support post leans against a wall, making a  $70^\circ$  angle with the ground. To the *nearest tenth of a foot*, how far up the wall will the support post reach?

- (1) 18.7      (2) **18.8**      (3) 6.9      (4) 68

- the 1990s, the number of people in the United States who are 65 years of age or older has increased by 50 percent, and the number of people 75 years of age or older has increased by 100 percent. The number of people 85 years of age or older has increased by 200 percent. The number of people 95 years of age or older has increased by 400 percent. The number of people 100 years of age or older has increased by 1,000 percent. The number of people 105 years of age or older has increased by 2,000 percent. The number of people 110 years of age or older has increased by 4,000 percent. The number of people 115 years of age or older has increased by 8,000 percent. The number of people 120 years of age or older has increased by 16,000 percent. The number of people 125 years of age or older has increased by 32,000 percent. The number of people 130 years of age or older has increased by 64,000 percent. The number of people 135 years of age or older has increased by 128,000 percent. The number of people 140 years of age or older has increased by 256,000 percent. The number of people 145 years of age or older has increased by 512,000 percent. The number of people 150 years of age or older has increased by 1,024,000 percent. The number of people 155 years of age or older has increased by 2,048,000 percent. The number of people 160 years of age or older has increased by 4,096,000 percent. The number of people 165 years of age or older has increased by 8,192,000 percent. The number of people 170 years of age or older has increased by 16,384,000 percent. The number of people 175 years of age or older has increased by 32,768,000 percent. The number of people 180 years of age or older has increased by 65,536,000 percent. The number of people 185 years of age or older has increased by 131,072,000 percent. The number of people 190 years of age or older has increased by 262,144,000 percent. The number of people 195 years of age or older has increased by 524,288,000 percent. The number of people 200 years of age or older has increased by 1,048,576,000 percent. The number of people 205 years of age or older has increased by 2,097,152,000 percent. The number of people 210 years of age or older has increased by 4,194,304,000 percent. The number of people 215 years of age or older has increased by 8,388,608,000 percent. The number of people 220 years of age or older has increased by 16,777,216,000 percent. The number of people 225 years of age or older has increased by 33,554,432,000 percent. The number of people 230 years of age or older has increased by 67,108,864,000 percent. The number of people 235 years of age or older has increased by 134,217,728,000 percent. The number of people 240 years of age or older has increased by 268,435,456,000 percent. The number of people 245 years of age or older has increased by 536,870,912,000 percent. The number of people 250 years of age or older has increased by 1,073,741,824,000 percent. The number of people 255 years of age or older has increased by 2,147,483,648,000 percent. The number of people 260 years of age or older has increased by 4,294,967,296,000 percent. The number of people 265 years of age or older has increased by 8,589,934,592,000 percent. The number of people 270 years of age or older has increased by 17,179,869,184,000 percent. The number of people 275 years of age or older has increased by 34,359,738,368,000 percent. The number of people 280 years of age or older has increased by 68,719,476,736,000 percent. The number of people 285 years of age or older has increased by 137,438,953,472,000 percent. The number of people 290 years of age or older has increased by 274,877,906,944,000 percent. The number of people 295 years of age or older has increased by 549,755,813,888,000 percent. The number of people 300 years of age or older has increased by 1,099,511,627,776,000 percent. The number of people 305 years of age or older has increased by 2,199,023,255,552,000 percent. The number of people 310 years of age or older has increased by 4,398,046,511,104,000 percent. The number of people 315 years of age or older has increased by 8,796,093,022,208,000 percent. The number of people 320 years of age or older has increased by 17,592,186,044,416,000 percent. The number of people 325 years of age or older has increased by 35,184,372,088,832,000 percent. The number of people 330 years of age or older has increased by 70,368,744,177,664,000 percent. The number of people 335 years of age or older has increased by 140,737,488,355,328,000 percent. The number of people 340 years of age or older has increased by 281,474,976,710,656,000 percent. The number of people 345 years of age or older has increased by 562,949,953,421,312,000 percent. The number of people 350 years of age or older has increased by 1,125,899,906,842,624,000 percent. The number of people 355 years of age or older has increased by 2,251,799,813,685,248,000 percent. The number of people 360 years of age or older has increased by 4,503,599,627,370,496,000 percent. The number of people 365 years of age or older has increased by 9,007,199,254,740,992,000 percent. The number of people 370 years of age or older has increased by 18,014,398,509,481,984,000 percent. The number of people 375 years of age or older has increased by 36,028,797,018,963,968,000 percent. The number of people 380 years of age or older has increased by 72,057,594,037,927,936,000 percent. The number of people 385 years of age or older has increased by 144,115,188,075,855,872,000 percent. The number of people 390 years of age or older has increased by 288,230,376,151,711,744,000 percent. The number of people 395 years of age or older has increased by 576,460,752,303,423,488,000 percent. The number of people 400 years of age or older has increased by 1,152,921,504,606,846,976,000 percent. The number of people 405 years of age or older has increased by 2,305,843,009,213,693,952,000 percent. The number of people 410 years of age or older has increased by 4,611,686,018,427,387,904,000 percent. The number of people 415 years of age or older has increased by 9,223,372,036,854,775,808,000 percent. The number of people 420 years of age or older has increased by 18,446,744,073,709,551,616,000 percent. The number of people 425 years of age or older has increased by 36,893,488,147,419,103,232,000 percent. The number of people 430 years of age or older has increased by 73,786,976,294,838,206,464,000 percent. The number of people 435 years of age or older has increased by 147,573,952,589,676,412,928,000 percent. The number of people 440 years of age or older has increased by 295,147,905,179,352,825,856,000 percent. The number of people 445 years of age or older has increased by 590,295,810,358,705,651,712,000 percent. The number of people 450 years of age or older has increased by 1,180,591,620,717,411,303,424,000 percent. The number of people 455 years of age or older has increased by 2,361,183,241,434,822,606,848,000 percent. The number of people 460 years of age or older has increased by 4,722,366,482,869,645,213,696,000 percent. The number of people 465 years of age or older has increased by 9,444,732,965,739,290,427,392,000 percent. The number of people 470 years of age or older has increased by 18,889,465,931,478,580,854,784,000 percent. The number of people 475 years of age or older has increased by 37,778,931,862,957,161,709,568,000 percent. The number of people 480 years of age or older has increased by 75,557,863,725,914,323,419,136,000 percent. The number of people 485 years of age or older has increased by 151,115,727,451,828,646,838,272,000 percent. The number of people 490 years of age or older has increased by 302,231,454,903,657,293,676,544,000 percent. The number of people 495 years of age or older has increased by 604,462,909,807,314,587,353,088,000 percent. The number of people 500 years of age or older has increased by 1,208,925,819,614,629,174,706,176,000 percent. The number of people 505 years of age or older has increased by 2,417,851,639,229,258,349,412,352,000 percent. The number of people 510 years of age or older has increased by 4,835,703,278,458,516,698,824,704,000 percent. The number of people 515 years of age or older has increased by 9,671,406,556,917,033,397,649,408,000 percent. The number of people 520 years of age or older has increased by 19,342,813,113,834,066,795,298,816,000 percent. The number of people 525 years of age or older has increased by 38,685,626,227,668,133,590,597,632,000 percent. The number of people 530 years of age or older has increased by 77,371,252,455,336,267,181,195,264,000 percent. The number of people 535 years of age or older has increased by 154,742,504,910,672,534,362,390,528,000 percent. The number of people 540 years of age or older has increased by 309,485,009,821,345,068,724,781,056,000 percent. The number of people 545 years of age or older has increased by 618,970,019,642,690,137,449,562,112,000 percent. The number of people 550 years of age or older has increased by 1,237,940,039,285,380,274,899,124,224,000 percent. The number of people 555 years of age or older has increased by 2,475,880,078,570,760,549,798,248,448,000 percent. The number of people 560 years of age or older has increased by 4,951,760,157,141,521,099,596,496,896,000 percent. The number of people 565 years of age or older has increased by 9,903,520,314,283,042,199,193,993,792,000 percent. The number of people 570 years of age or older has increased by 19,807,040,628,566,084,398,387,

(1) 6.4                  (2) 8                  (3) **12.5**                  (4) 16

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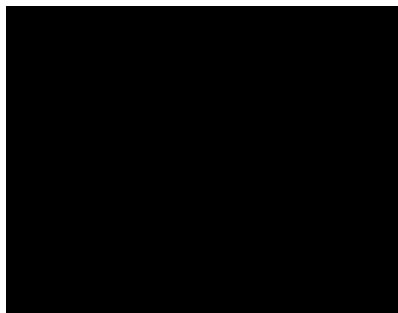
(1) 6                      (2) 2                      (3) 0.5                      (4) 5.5

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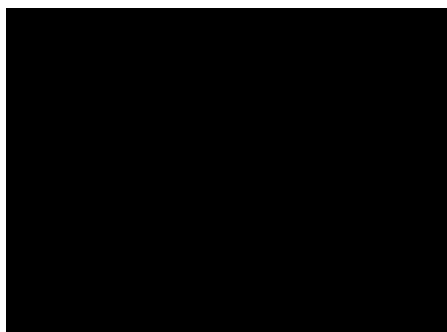
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9. Given the right triangle in the diagram below, what is the value of  $x$ , to the nearest foot?



- (1) 22                      (2) 18                      (3) 17                      (4) 11

10. In scalene triangle  $ABC$  shown in the diagram below, .



Which equation is always true?

- (1)  $\sin A = \frac{10}{14}$                       (2)  $\sin B = \frac{12}{14}$   
(3)  $\sin C = \frac{10}{14}$                       (4)  $\sin C = \frac{12}{14}$

11. Which equation represents a line that is perpendicular to the line represented by  $y = \frac{3}{4}x + 2$ ?

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

12. What is an equation of the line with y-intercept -15 and is perpendicular to the line whose equation is  $y = \frac{3}{4}x + 2$ ?

- (1)  $y = \frac{3}{4}x - 15$                       (2)  $y = -\frac{3}{4}x - 15$   
(3)  $y = \frac{4}{3}x - 15$                       (4)  $y = -\frac{4}{3}x - 15$

13. As shown in the diagram below, the angle of elevation from a point on the ground to the top of the tree is \_\_\_\_\_.



If the point is 20 feet from the base of the tree, what is the height of the tree, to the *nearest tenth of a foot*?

- (1) 29.7            (2) 16.6            **(3) 13.5**            (4) 11.2

14. Which equation represents a line that is perpendicular to the line whose equation is  $3x - 2y = 7$ ?

- (1) (2)
  - (3) (4)

15. What is the slope of a line parallel to the line whose equation is  $2y = -6x + 8$ ?

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

16. What is an equation of the line with y-intercept 6 and is parallel to the line whose equation is  $y = x - 4$ ?

- (1)  $y = x$

(3)  $y = x +$

(2)  $y = x$

**(4)  $y = x + \mathbf{6}$**

17. The lines  $3y - 6x = 4$  and  $2y = x - 9$  are

- (1) the same line
- (2) neither parallel nor perpendicular**
- (3) parallel
- (4) perpendicular

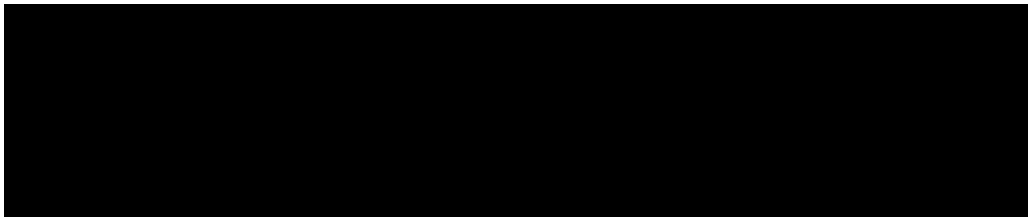
18. The graphs of the lines represented by the equations \_\_\_\_\_ and \_\_\_\_\_ are

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

19. When writing a geometric proof, which angle relationship could be used alone to justify that two angles are congruent?

- (1) linear pair of angles
- (2) supplementary angles
- (3) adjacent angles
- (4) vertical angle**

20. In the accompanying diagram, line  $a$  intersects line  $b$ .



What is the value of  $x$ ?

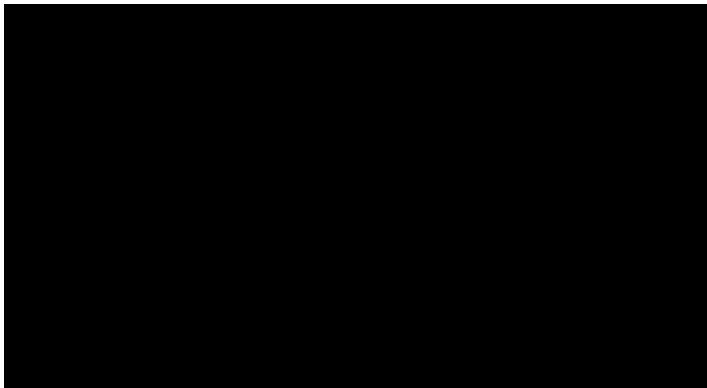
- (1) 5
- (2) 10**
- (3) -10
- (4) 90

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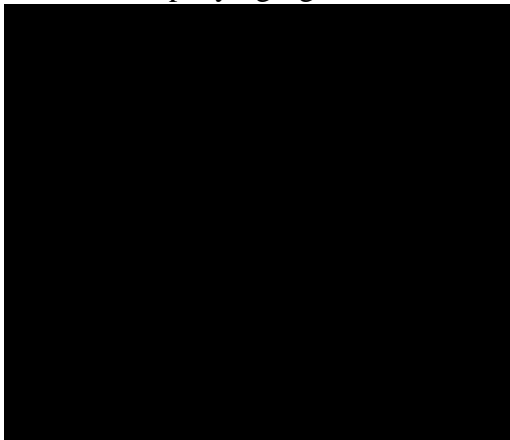
21. In the diagram below,                      and                      are shown with  $m$                       and                      .



What is  $m$                       ?

- (1) 125                      **(2) 115**                      (3) 65                      (4) 55

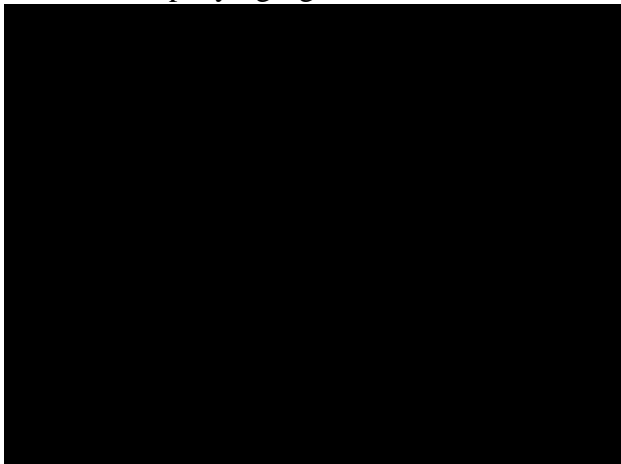
22. In the accompanying figure,                      ,                      , and                      .



What is the value of                      ?

- (1) 75                      (2) 105                      (3) 150                      **(4) 180**

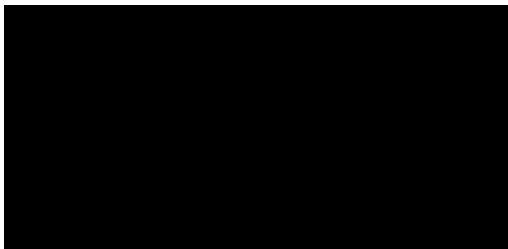
23. In the accompanying figure,



Which equation shows how to calculate the value of ?

- |     |     |
|-----|-----|
| (1) | (2) |
| (3) | (4) |

24. As shown in the diagram below of , is extended through  $D$ ,  
 , and .



Which statement is true?

- (1)  $AC < AB$     (2)  $AB > BC$     (3)  $AC > AB$     (4)  $BC < AC$



