

MAP TEST #1

1. The Tunnel of Fear ride climbs straight up to its peak 50 meters above the ground. Then, it drops 65 meters into an underground tunnel. What is the elevation of the tunnel relative to the ground?

2. Evaluate $-a+(-b)$ where $a=6.05$ and $b=3.611$

3. Which expression is equivalent to the following complex fraction?

$$\frac{\frac{-a}{-b}}{\frac{c}{d}}$$

- a) $\frac{-a}{-b} \div \frac{c}{d}$
b) $\frac{c}{d} \div \frac{-a}{-b}$
c) None of the above

4. Solve for x.

$$-30=5(x+1)$$

5. Solve for x. Give an exact answer in simplified form.

$$4x+4 \leq 9x+8$$

6. Solve for y. Give an exact answer in simplified form.

$$5y+3 > -7y + 13$$

7. Solve for g.

$$-3+5+6g=11-3g$$

8. Which expression is equivalent to $\frac{\frac{2}{y} + \frac{y}{2}}{y}$? Assume $y \neq 0$.

- a) $\frac{4+y^2}{2y^2}$
- b) $\frac{1}{y}$
- c) $2y$
- d) 2

9. Which expression is equivalent to $\frac{\frac{q}{r}+1}{\frac{r}{q}-1}$?

Assume $q \neq 0$, $r \neq 0$, and $q \neq r$

- a) $-\frac{q}{r}$
- b) $-\frac{q^2}{r^2}$
- c) $\frac{q+r}{q-r}$
- d) $\frac{q(q+r)}{r(r-q)}$

10. Which expression is equivalent to $\frac{\left(\frac{2}{x+y}\right)}{\left(\frac{x+y}{2}\right)}$?

- a) $x+y$
- b) $\frac{4}{(x+y)^2}$
- c) $\frac{x+y}{2}$
- d) 1

11. Solve for f Give an exact answer.

$$4(0.5f-0.25) = 6+f$$

12. Solve for k. Give an exact answer.

$$\frac{1}{4}k = 3\left(-\frac{1}{4}k + 3\right)$$

13. Solve for h. Give an exact answer.

$$3h = 7\left(\frac{2}{7} - \frac{3}{7}h\right) - 10$$

14. Solve for x.

$$ax+3x = bx+5$$

15. Solve for x.

$$-8x+14 \geq 60 \text{ or } -4x+50 < 58$$

- a) $x \leq -\frac{23}{4}$ or $x > -2$
- b) $x \leq -\frac{23}{4}$
- c) $x > -2$
- d) There are no solutions
- e) All values of x are solutions

16. Solve for x.

$$4x-4 < 8 \text{ and } 9x+5 > 23$$

- a) $2 < x < 3$
- b) $x < 2$ or $x > 3$
- c) There are no solutions
- d) All values of x are solutions

17. Solve for x.

$$5x-29 > -34 \text{ or } 2x+31 < 29$$

- a) $x < -1$ or $x > -1$
- b) $x < -1$
- c) $x > -1$
- d) There are no solutions
- e) All values of x are solutions

18. Solve the system of equations.

$$3x+8y = 15$$

$$2x-8y = 10$$

19. Solve the system of equations.

$$-3y+5x = 26$$

$$-2y -5x=-16$$

20. Solve the system of equations.

$$12x - 5y = -20$$

$$y = x+4$$

21. Wang Yong owes the bank \$8500. To repay the debt, he paid a fixed amount back to the bank each month. After 12 months, his remaining debt was \$6460. How much did Wang Yong pay each month? How long did it take Wang Yong to pay back his entire debt?

22. Andrei has a glass tank. First, he wants to put in some marbles, each of which has a volume of 0.04 liters. Then, he wants to fill the tank with water until it's completely full. If he uses 50 marbles, he will have to add 33 liters of water. What is the volume of the tank? Andrei has exactly 20 liters of water. How many marbles does he need so the tank is full?
23. Giselle works as a carpenter and as a blacksmith. She earns \$20 per hour as a carpenter and \$25 per hour as a blacksmith. Last week, Giselle worked both jobs for a total of 30 hours, and earned a total of \$690. How long did Giselle work as a carpenter last week, and how long did she work as a blacksmith?
24. A plane has 360 total seats, which are divided into economy class and business class. For every 13 seats in economy class, there are 5 seats in business class. How many seats are there in each class?
25. Sakura speaks 150 words per minute on average in Hungarian, and 190 words per minute on average in Polish. She once gave cooking instructions in Hungarian, followed by cleaning instructions in Polish. Sakura spent 5 minutes total giving both instructions, and spoke 270 more words in Polish than in Hungarian. How long did Sakura speak in Hungarian, and how long did she speak in Polish?

26. Wolfrich lived in Portugal and Brazil for a total period of 14 months in order to learn Portuguese. He learned an average of 130 new words per month when he lived in Portugal, and an average of 150 new words per month when he lived in Brazil. In total, he learned 1920 new words. How long did Wolfrich live in Portugal and how long did he live in Brazil?

27. A battery was charged. When the charging began, it was 23 percent full. After 30 minutes of charging, the battery was 89 percent full. How fast was the battery charged? How long did it take the battery to be fully charged?

28. Factor completely.

$$x^2 - 3xy - 10y^2$$

29. Factor the quadratic expression completely.

$$12x^2 + 17x + 6$$

30. Members of the swim team want to wash their hair. The bathroom has less than 5600 liters of water and at most 2.5 liters of shampoo. $70L+60S < 5600$ represents the number of long-haired members L and short-haired members S who can wash their hair with less than 5600 liters of water. $0.02L+0.01S \leq 2.5$ represents the number of long-haired members and short-haired members who can wash their hair with at most 2.5 liters of shampoo. Does the bathroom have enough water and shampoo for 8 long-haired members and 7 short-haired members?
- The bathroom has enough water and shampoo.
 - The bathroom has enough water but not enough shampoo.
 - The bathroom has enough shampoo but not enough water.
 - The bathroom has neither enough water nor enough shampoo.

31. Find one value of x that is a solution to the equation:

$$(3x-1)^2+12x-4 = 0$$

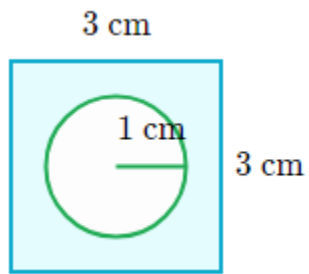
32. Solve the exponential equation for x .

$$2^{9x+2} = 16^{5x-2}$$

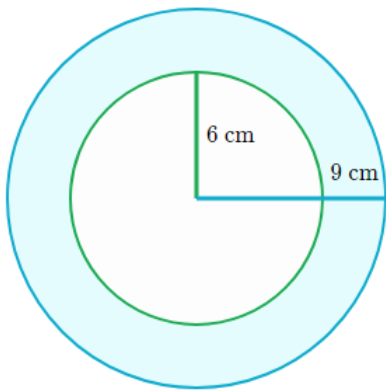
33. Solve. $-7x^2 + 7x + 1 = -8$

- $x = \frac{-7 \pm \sqrt{301}}{-14}$
- $x = -1, \frac{7}{10}$
- $x = \frac{2 \pm \sqrt{5}}{-2}$
- $x = \frac{1 \pm \sqrt{57}}{-8}$

34. A circle with radius of 1 cm sits inside a 3cmx3cm rectangle. What is the area of the shaded region?



35. A circle with radius of 6 cm sits inside a circle with radius of 9 cm. What is the area of the shaded region?



36. Which expressions are equivalent to $(5^3 \cdot 5^2)^4$?

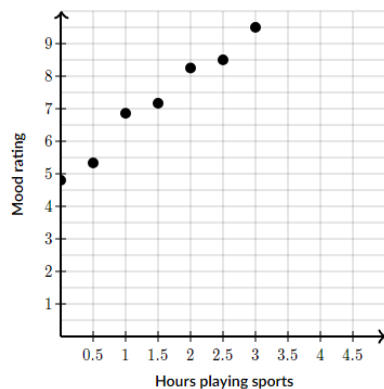
- a) 25^{20}
- b) $(25^5)^4$
- c) None of the above

37. Simplify. Multiply and remove all perfect squares from inside the square roots. Assume x is positive.

$$2\sqrt{7x} \cdot 3\sqrt{14x^2}$$

38. Jacob distributed a survey to his fellow students asking them how many hours they'd spent playing sports in the past day. He also asked them to rate their mood on a scale from 0 to 10, with 10 being the happiest. Which of the following is the best estimate of the average change in mood rating associated with a 1-hour increase in hours playing sports?

- a) 1.5 points
- b) 4 points
- c) 7 points
- d) 9.5 points



39. Urpi and Manco are playing a game where they flip a fair coin four times and try to predict the outcomes. Using the sample space of possible outcomes listed below, answer each of the following questions.

What is $P(A)$, the probability that the second flip is heads

What is $P(B)$, the probability that the fourth flip is heads?

What is $P(A \text{ and } B)$, the probability that the second flip is heads and the fourth flip is heads?

40. A jar contains 4 red marbles, 4 green marbles, and 5 blue marbles. If we choose a marble, then another marble without putting the first one back in the jar, what is the probability that the first marble will be blue and the second will be green?

41. In a class of 10, there are 2 students who forgot their lunch. If the teacher chooses 2 students, what is the probability that both of them forgot their lunch?

42. There are 500 students in a high school senior class. Of these 500 students, 300 regularly wear a necklace to school, 200 regularly wear a ring, and 125 regularly wear a necklace and a ring. Using this information, answer each of the following questions. Let N be the event that a randomly selected senior regularly wears a necklace and R be the event that a randomly selected senior regularly wears a ring.

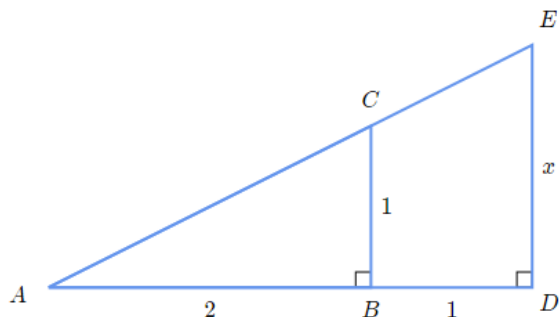
What is $P(N)$ the probability that a senior wears a necklace?

What is $P(R)$, the probability that a senior wears a ring?

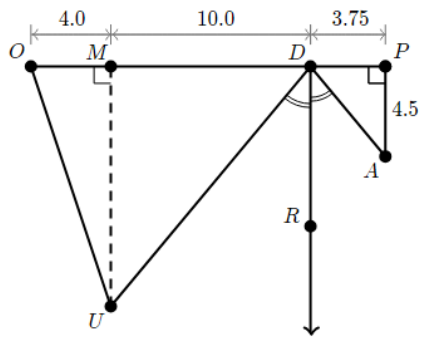
What is $P(N \text{ and } R)$, the probability that a senior wears a necklace *and* a ring?

What is $P(N \text{ or } R)$, the probability that a senior wears a necklace *or* a ring?

43. Solve for x .

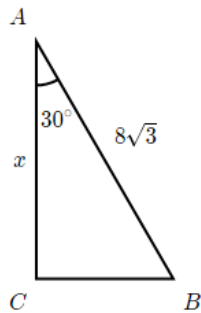


44. In the diagram below, $\overrightarrow{DR}$ is perpendicular to $\overrightarrow{OP}$

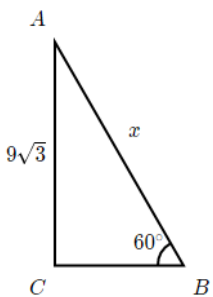


Find the area of $\triangle DUO$.

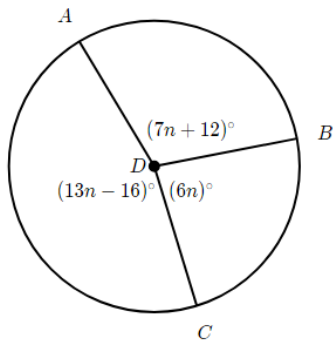
45. In the right triangle shown, $\angle A = 30^\circ$ and $AB = 8\sqrt{3}$ How long is AC?



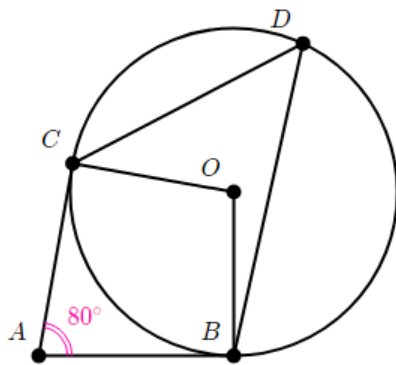
46. In the right triangle shown, $\angle B = 60^\circ$ and $AC = 9\sqrt{3}$ How long is AB?



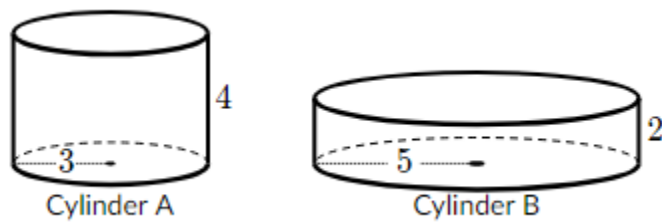
47. Circle D is below. What is the arc measure of $\widehat{BC}$ in degrees?



48. Angle A is circumscribed about circle O. What is the measure of $\angle D$?



49. What is the ratio of the volume of Cylinder A to the volume of Cylinder B?



A $\frac{18}{25}$

B $\frac{5}{6}$

C $\frac{6}{5}$

D $\frac{25}{18}$

50. Point A is at $(-3, -5)$ and point B is at $(1, -9)$. What is the midpoint of line segment $\overline{AB}$?