

**Kumon Math Challenge – Sample Questions**  
**Grade 10**

**Simplify the following.**

1.  $\frac{x^2 - 25}{x^2 - 7x + 10} =$

A.  $\frac{x - 5}{x - 2}$

B.  $\frac{x + 4}{x + 2}$

C.  $\frac{x + 5}{x - 2}$

D.  $\frac{2x + 3}{x - 2}$

**Solve the following for x.**

2.  $\frac{x}{4} = \frac{2}{x} + \frac{x - 2}{3}$

A.  $x = 3 \pm 2\sqrt{4i}$

B. Not possible

C.  $x = 3 \pm 4\sqrt{2i}$

D.  $x = 4 \pm 2\sqrt{2i}$

**Simplify the following:**

3.  $(-8)^{\frac{1}{3}} =$

A. 2

B.  $-\frac{1}{3}$

C.  $-\frac{8}{24}$

D. -2

4. Two pipes, Pipe A and Pipe B, are used to fill a water tank. The empty tank is filled in 10 hours with both pipes running the whole time, together. If Pipe A is used alone for 6 hours and then turned off, Pipe B can then be used for 18 hours to fill the tank. How long would it take each pipe to fill the tank on its own?

A. Pipe A: 15 hours; Pipe B: 30 hours

B. Pipe A: 12 hours; Pipe B: 22 hours

C. Pipe A: 14 hours; Pipe B: 38 hours

D. Pipe A: 15 hours; Pipe B: 20 hours

5. What are the chances of rolling the following sequence of numbers with a single die:

**2, 6, an even number, 3, an odd number, then a 6 or a 5.**

A. 1 in 22,592

B. 1 in 2,592

C. 1 in 25,592

D. 1 in 222,592

6. A, B and C are angles in a triangle. If  $\sin A = 1/2$  and  $\sin B = 1$ , what is the measurement in degrees of C?

A. 40 degrees

B. 50 degrees

C. 60 degrees

D. 70 degrees

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7. Find the area between the graph of  $y = x^3 + 2x^2 - x - 2$  and the line  $y = -x - 2$ .

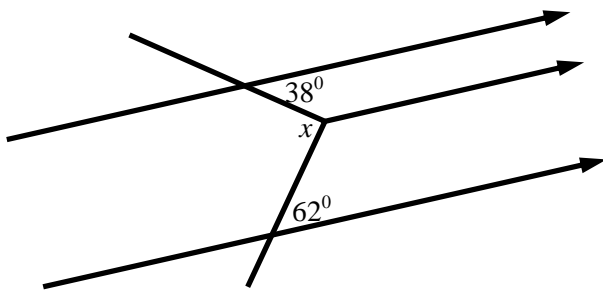
- A. 4  
B.  $\frac{8}{3}$   
C.  $-\frac{28}{3}$   
D.  $\frac{4}{3}$

Continue the patterns.

8. 5   9   21   57   165...

- A. 495  
B. 330  
C. 273  
D. 489

Find the angle measurements indicated by the variables in the following.

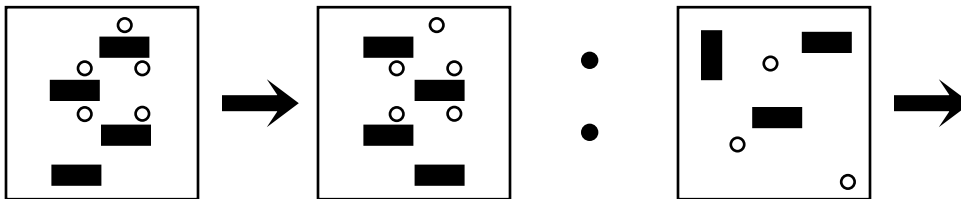


9.  $x =$

- A.  $90^{\circ}$   
B.  $95^{\circ}$   
C.  $118^{\circ}$   
D.  $100^{\circ}$

Use the relationship between the first two pictures to find the last picture.

- 10.



- A.
- B.
- C.
- D.

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**ANSWER KEY**

1. C
2. D
3. D
4. A
5. B
6. C
7. D
8. D
9. D
10. D