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## GRE Test Preparation : **Quantitative Comparison**



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## GRE Test Prep : Quantitative Comparison

**Description:** Compare the two quantities and choose the best answer from four choices given.

**Question 1:**

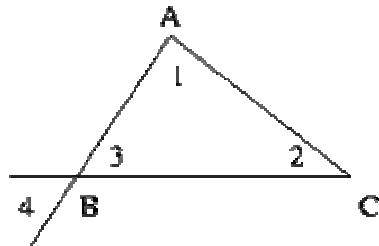


Diagram is illustrative and is not drawn to scale.

Quantity A = Measure of angle 1 + Measure of angle 2 + Measure of angle 4

Quantity B =  $180^\circ$

**Options:**  
Quantity A equals Quantity B  
Quantity A is greater  
Quantity B is greater  
Relationship Indeterminate

**Answer:** Quantity A equals Quantity B

**Explanation:** In the figure, angles 3 and 4 are vertically opposite angles and are equal. Also the sum of the three angles of a triangle is  $180^\circ$ . Hence angle 1 + angle 2 + angle 4 =  $180^\circ$ .

**Hint:** Angles 3 and 4 are vertically opposite angles and are therefore ...

**Question 2:**

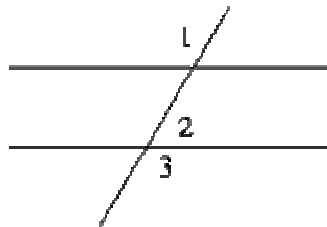


Diagram is illustrative and is not drawn to scale.

Quantity A = Measure of angle 2 + Measure of angle 3

Quantity B =  $180^\circ$

**Options:**  
Quantity A equals Quantity B  
Quantity A is greater  
Quantity B is greater  
Relationship Indeterminate

**Answer:** Quantity A equals Quantity B

**Explanation:** Angles 2 and 3 lie on a straight line and are supplementary angles.  
Hence their sum =  $180^\circ$ .

**Hint:** Are angles 2 and 3 supplementary angles?

**Question 3:**

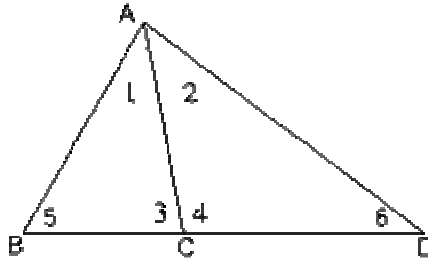


Diagram is illustrative and is not drawn to scale.

Quantity A = Measure of angle 1 + Measure of angle 3

Quantity B = Measure of angle 2 + Measure of angle 4

**Options:** Relationship Indeterminate

Quantity A is greater

Quantity B is greater

Quantity A equals Quantity B

**Answer:** Relationship Indeterminate

**Explanation:** Quantity A =  $180^\circ$  - angle 5 and Quantity B =  $180^\circ$  - angle 6.

Now the values of A and B depend on angles 5 and 6 about which nothing is given.

Hence the relationship is indeterminate.

**Hint:** Can Quantity A and Quantity B be expressed in terms of angles 5 and 6?

**Question 4:**  $a, b, c$  and  $d$  are four consecutive integers.

Quantity A = The arithmetic mean of  $a$  and  $d$

Quantity B = The arithmetic mean of  $b$  and  $c$

**Options:** Quantity A equals Quantity B

Quantity A is greater

Quantity B is greater

Relationship Indeterminate

**Answer:** Quantity A equals Quantity B

**Explanation:** If  $a, b, c$  and  $d$  are four consecutive integers, then  $b = a + 1$ ;  $c = a + 2$ ; and  $d = a + 3$ .

Quantity A =  $(a + d)/2 = (a + a + 3)/2 = (2a + 3)/2$ .

Quantity B =  $(b + c)/2 = (a + 1 + a + 2)/2 = (2a + 3)/2$ .

**Hint:** If  $a, b, c$  and  $d$  are four consecutive integers, then  $b = a + 1$ ;  $c = a + 2$ ; and  $d = a + 3$ .

**Question 5:**  $2 < z < 4$

Quantity A =  $\pi^2 z^3$

Quantity B =  $\pi^3 z^2$

**Options:** Relationship Indeterminate

Quantity A is greater  
Quantity B is greater  
Quantity A equals Quantity B

**Answer:** Relationship Indeterminate

**Explanation:** You could substitute values for  $z$  between 2 and 4 to compare.  
An alternative simple strategy is to divide both Quantity A and B by  $\pi^2 z^2$ .  
Then Quantity A =  $z$  and Quantity B =  $\pi$ .  
We note that Quantity A lies between 2 and 4, whereas Quantity B equals about 3.14

**Hint:** Divide both Quantity A and B by  $\pi^2 z^2$ .

**Question 6:**  $yz < 0$   
Quantity A =  $(y - z)^2$   
Quantity B =  $y^2 + z^2$

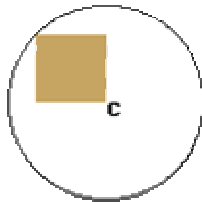
**Options:** Quantity A is greater  
Quantity B is greater  
Quantity A equals Quantity B  
Relationship Indeterminate

**Answer:** Quantity A is greater

**Explanation:**  $(y - z)^2 = (y - z)(y - z) = y^2 + z^2 - 2yz$ .  
Since  $yz$  is negative,  $-2yz$  is positive. So, Quantity A > Quantity B.

**Hint:**  $(y - z)^2 = (y - z)(y - z) = y^2 + z^2 - 2yz$ .

**Question 7:**



A circle of radius  $r$  has its center at C.  
Quantity A = The area of the colored square  
Quantity B =  $0.5r^2$

**Options:** Quantity A equals Quantity B  
Quantity A is greater  
Quantity B is greater  
Relationship Indeterminate

**Answer:** Quantity A equals Quantity B

**Explanation:** Let  $a$  be the length of the side of the square.  
Area of colored square =  $a^2$ .  
The diagonal of the square is the radius of the circle.  
By Pythagoras' Theorem,  $a^2 + a^2 = r^2$  or  $2a^2 = r^2$ .  
Area of colored square =  $a^2 = 0.5r^2$ .

**Hint:** The diagonal of the colored square is the radius of the circle. So, by Pythagoras' Theorem, ...

**Question 8:**

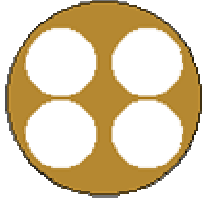


Diagram is illustrative and is not drawn to scale.

The total area of the four identical small circles equals the area of the colored region.

Quantity A = Radius of the large circle

Quantity B = Diameter of the small circle

**Options :**

Quantity A is greater

Quantity B is greater

Quantity A equals Quantity B

Relationship Indeterminate

**Answer:**

Quantity A is greater

**Explanation:**

Let the radius of the large circle be  $R$  and the radius of each of the four small circles be  $r$ .

Total area of four identical small circles =  $4 (\pi r^2)$ .

Area of colored region =  $\pi R^2 - 4 (\pi r^2)$ .

Since these areas are equal,  $\pi R^2 - 4 \pi r^2 = 4 \pi r^2$  or  $\pi R^2 = 8 \pi r^2$ .

Thus,  $R = \sqrt{8} r = \sqrt{2} (2r) = 1.414$  (diameter of the small circle).

**Hint:**

Let the radius of the large circle be  $R$  and the radius of each of the four small circles be  $r$ .

Total area of four identical small circles =  $4 (\pi r^2)$ .

Area of colored region =  $\pi R^2 - 4 (\pi r^2)$ .

**Question 9:** Quantity A = The circumference of a circle whose diameter is 37

Quantity B = The circumference of a circle whose radius is 19

**Options:**

Quantity B is greater

Quantity A is greater

Quantity A equals Quantity B

Relationship Indeterminate

**Answer:**

Quantity B is greater

**Explanation:**

A circle whose radius is 19 has a diameter equal to 38. A circle with a larger diameter will have a larger circumference, because circumference  $C$  is proportional to diameter  $D$  (note  $C = \pi D$ ).

**Hint:**

Does the circle with the larger diameter have the larger circumference?

**Question 10:** Quantity A =  $(1/25)^{1/2} + (1/144)^{1/2}$     Quantity B =  $[(1/25) + (1/144)]^{1/2}$

**Options:**

Quantity A is greater

Quantity B is greater

Quantity A equals Quantity B

Relationship Indeterminate

**Answer:**

Quantity A is greater

**Explanation:**  $(1/25)^{1/2} + (1/144)^{1/2} = (1/5) + (1/12) = 17/60$ .  
 $[(1/25) + (1/144)]^{1/2} = [(144+25)/(25 \times 144)]^{1/2} = [169/(25 \times 144)]^{1/2} = 13/60$ .

**Hint:** Is  $(1/25)^{1/2} = 1/5$  and  $(1/144)^{1/2} = 1/12$  ?

**Question 11:** Quantity A = Time to travel 95 miles at 50 miles per hour  
Quantity B = Time to travel 125 miles at 60 miles per hour

**Options:** Quantity B is greater  
Quantity A is greater  
Quantity A equals Quantity B  
Relationship Indeterminate

**Answer:** Quantity B is greater

**Explanation:** Time = Distance / Speed  
Time to travel 95 miles at 50 miles per hour =  $95/50 < 2$  hours.  
Time to travel 125 miles at 60 miles per hour =  $125/60 > 2$  hours.  
Note that you save time by not calculating the exact values of Quantity A and Quantity B.

**Hint:** Speed = Distance / Time

**Question 12:** Quantity A =  $4 / 100$     Quantity B =  $0.012 / 3$

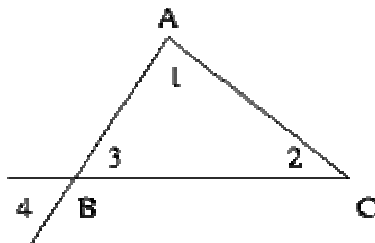
**Options:** Quantity A is greater  
Quantity B is greater  
Quantity A equals Quantity B  
Relationship Indeterminate

**Answer:** Quantity A is greater

**Explanation:**  $4/100 = 0.04$  and  $0.012/3 = 0.004$ . Note that  $0.04 > 0.004$

**Hint:** Is  $4/100 = 0.04$  and  $0.012/3 = 0.004$  ?

**Question 13:**



Let ABC be *any* triangle.

Quantity A = Measure of angle 1 + Measure of angle 2

Quantity B =  $90^\circ$

**Options:** Relationship Indeterminate  
Quantity A is greater  
Quantity B is greater  
Quantity A equals Quantity B

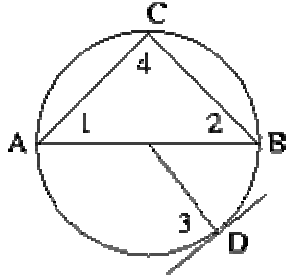
**Answer:** Relationship Indeterminate

**Explanation:** Angles 1 and 2 can take any two values. Hence the relationship is

indeterminate.

**Hint:** ABC can be *any* triangle, i.e., acute-angled, right-angled, or obtuse-angled.

**Question 14:**



AB is the diameter of the circle, and the line touching the circle at point D is a tangent to the circle.

Quantity A = Measure of angle 1 + Measure of angle 2

Quantity B = Measure of angle 3

**Options:** Quantity A equals Quantity B

Quantity A is greater

Quantity B is greater

Relationship Indeterminate

**Answer:** Quantity A equals Quantity B

**Explanation:** In triangle ABC, angle 1 + angle 2 + angle 4 =  $180^\circ$ .

Angle subtended by the diameter on the circumference = angle 4 =  $90^\circ$ .

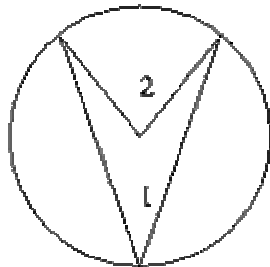
Therefore angle 1 + angle 2 =  $90^\circ$ .

Also the angle between the radius and a tangent at the point of contact = angle 3 =  $90^\circ$ .

So angle 1 + angle 2 = angle 3.

**Hint:** What is the angle subtended by the diameter on the circumference of a circle? What is the angle between the radius and a tangent at the point of contact?

**Question 15:**



Quantity A = Measure of angle 2

Quantity B = Measure of angle 1

**Options:** Quantity A is greater

Quantity B is greater

Quantity A equals Quantity B

Relationship Indeterminate

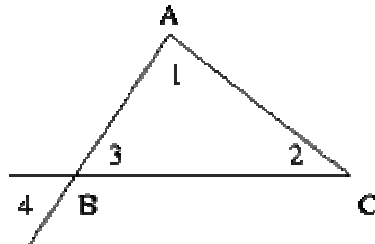
**Answer:** Quantity A is greater

**Explanation:** Angle subtended by an arc at the center of a circle is double the angle subtended by the same arc on the circumference, i.e., angle 2 is twice angle 1

1.

**Hint:** How does the angle subtended by an arc at the center of a circle compare with the angle subtended by the same arc on the circumference?

**Question 16:**



Quantity A = Measure of angle 3  
Quantity B = Measure of angle 4

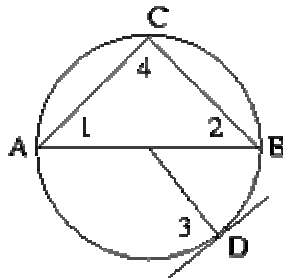
**Options:** Quantity A equals Quantity B  
Quantity A is greater  
Quantity B is greater  
Relationship Indeterminate

**Answer:** Quantity A equals Quantity B

**Explanation:** Angles 3 and 4 are vertically opposite angles and hence always equal.

**Hint:** Angles 3 and 4 are vertically opposite angles and are ...

**Question 17:**



AB is the diameter of the circle, and the line touching the circle at point D is a tangent to the circle.

Quantity A = Measure of angle 3  
Quantity B = Measure of angle 4

**Options:** Quantity A equals Quantity B  
Quantity A is greater  
Quantity B is greater  
Relationship Indeterminate

**Answer:** Quantity A equals Quantity B

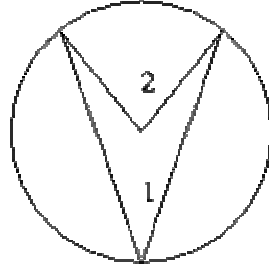
**Explanation:** Angle 3 = angle between the radius and a tangent at the point of contact =  $90^\circ$ .

Angle 4 = angle subtended by the diameter on the circumference =  $90^\circ$ .

**Hint:** What is the angle between the radius of a circle and a tangent at the point of contact? What is the angle subtended by the diameter of a circle on the circumference?



**Question 18:**



Given angle 2 =  $120^\circ$

Quantity A = Measure of angle 1 + Measure of angle 2

Quantity B =  $180^\circ$

**Options:** Quantity A equals Quantity B  
Quantity A is greater  
Quantity B is greater  
Relationship Indeterminate

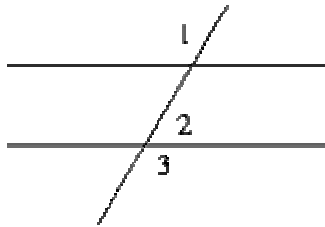
**Answer:** Quantity A equals Quantity B

**Explanation:** The angle subtended by an arc at the center is double the angle subtended by the same arc on the circumference.

If angle 2 =  $120^\circ$ , then angle 1 =  $60^\circ$  and angle 1 + angle 2 =  $180^\circ$ .

**Hint:** How does the angle subtended by an arc at the center of a circle compare with the angle subtended by the same arc on the circumference?

**Question 19:**



Quantity A = Measure of angle 2

Quantity B = Measure of angle 3

**Options:** Relationship Indeterminate  
Quantity A is greater  
Quantity B is greater  
Quantity A equals Quantity B

**Answer:** Relationship Indeterminate

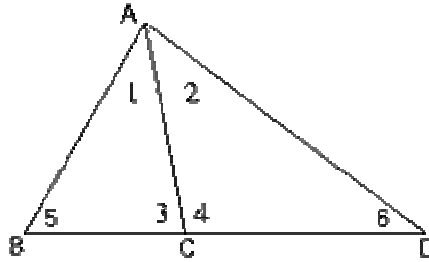
**Explanation:** Angle 2 + Angle 3 =  $180^\circ$  (supplementary angles).

However, the angles 2 and 3 can individually take any value.

So the relationship is indeterminate.

**Hint:** All we can say is that angles 2 and 3 are supplementary angles (add up to  $180^\circ$ ).

**Question 20:**



Quantity A = Measure of angle 3

Quantity B = Measure of angle 2

**Options:**

- Quantity A is greater
- Quantity B is greater
- Quantity A equals Quantity B
- Relationship Indeterminate

**Answer:**

Quantity A is greater

**Explanation:**

For the triangles ABC and ABD we have:

$$\text{angle } 5 + \text{angle } 1 + \text{angle } 3 = 180^\circ$$

$$\text{angle } 5 + \text{angle } 1 + \text{angle } 2 + \text{angle } 6 = 180^\circ$$

From the above equations, angle 3 = angle 2 + angle 6.

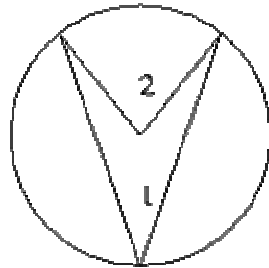
So angle 3 is greater than angle 2.

**Hint:**

The angles of a triangle add up to  $180^\circ$ .

Based on this fact, write equations for triangles ABC and ABD.

**Question 21:**



Quantity A = Measure of angle 1 + Measure of angle 2

Quantity B =  $180^\circ$

**Options:**

- Relationship Indeterminate
- Quantity A is greater
- Quantity B is greater
- Quantity A equals Quantity B

**Answer:**

Relationship Indeterminate

**Explanation:**

The angle subtended by an arc at the center (angle 2) is double the angle subtended by the same arc on the circumference (angle 1).

angle 1 + angle 2 = angle 1 + 2 (angle 1) = 3 (angle 1). Depending on whether angle 1 is less than, greater than or equal to  $60^\circ$ , (angle 1 + angle 2) will be less than, greater than or equal to  $180^\circ$ .

Hence the relationship is indeterminate.

**Hint:**

The angle subtended by an arc at the center of a circle is double the angle subtended by the same arc on the circumference.

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