

PreCalc 11 Chapter 2 Review Pack v1

Answer Section

MULTIPLE CHOICE

1. ANS: D PTS: 0 DIF: Easy
REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1
TOP: Relations and Functions KEY: Conceptual Understanding
2. ANS: D PTS: 0 DIF: Easy
REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1
TOP: Relations and Functions KEY: Conceptual Understanding
3. ANS: A PTS: 0 DIF: Moderate
REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
4. ANS: D PTS: 0 DIF: Moderate
REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
5. ANS: C PTS: 0 DIF: Moderate
REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
6. ANS: C PTS: 0 DIF: Moderate
REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
7. ANS: B PTS: 0 DIF: Moderate
REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
8. ANS: A PTS: 0 DIF: Easy
REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
9. ANS: D PTS: 0 DIF: Moderate
REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
10. ANS: D PTS: 0 DIF: Moderate
REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
11. ANS: C PTS: 0 DIF: Moderate
REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
12. ANS: C PTS: 0 DIF: Difficult
REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
13. ANS: D PTS: 0 DIF: Difficult
REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge | Conceptual Understanding
14. ANS: D PTS: 0 DIF: Easy
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge

15. ANS: B PTS: 0 DIF: Easy
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
16. ANS: A PTS: 0 DIF: Moderate
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
17. ANS: B PTS: 0 DIF: Moderate
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
18. ANS: A PTS: 0 DIF: Moderate
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
19. ANS: B PTS: 0 DIF: Easy
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
20. ANS: D PTS: 0 DIF: Easy
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge | Conceptual Understanding
21. ANS: B PTS: 0 DIF: Easy
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
22. ANS: C PTS: 0 DIF: Moderate
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
23. ANS: A PTS: 0 DIF: Easy
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
24. ANS: D PTS: 0 DIF: Easy
REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge | Problem-Solving Skills
25. ANS: B PTS: 0 DIF: Easy
REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Procedural Knowledge
26. ANS: A PTS: 0 DIF: Difficult
REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
27. ANS: D PTS: 0 DIF: Moderate
REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
28. ANS: D PTS: 0 DIF: Moderate
REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
29. ANS: C PTS: 0 DIF: Moderate
REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
30. ANS: D PTS: 0 DIF: Moderate
REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

31. ANS: A PTS: 0 DIF: Moderate
 REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
 TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge
32. ANS: C PTS: 0 DIF: Difficult
 REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2
 TOP: Relations and Functions KEY: Procedural Knowledge | Conceptual Understanding
33. ANS: A PTS: 0 DIF: Easy REF: 2.5 Solving Radical Equations
 LOC: 11.AN3 TOP: Relations and Functions KEY: Procedural Knowledge
34. ANS: B PTS: 0 DIF: Easy REF: 2.5 Solving Radical Equations
 LOC: 11.AN3 TOP: Relations and Functions KEY: Procedural Knowledge
35. ANS: A PTS: 0 DIF: Difficult REF: 2.5 Solving Radical Equations
 LOC: 11.AN3 TOP: Relations and Functions
 KEY: Conceptual Understanding | Procedural Knowledge

SHORT ANSWER

1. ANS:
 i) -8
 ii) 39
 iii) $20\frac{4}{5}$
 iv) 112

The values of the expressions from greatest to least are: 112, 39, $20\frac{4}{5}$, -8

PTS: 0 DIF: Moderate REF: 2.1 Absolute Value of a Real Number
 LOC: 11.AN1 TOP: Relations and Functions
 KEY: Conceptual Understanding | Procedural Knowledge

2. ANS:
 i) 25
 ii) -5
 iii) 5
 iv) 9

The values of the expressions from least to greatest are: -5, 5, 9, 25

PTS: 0 DIF: Moderate REF: 2.1 Absolute Value of a Real Number
 LOC: 11.AN1 TOP: Relations and Functions
 KEY: Conceptual Understanding | Procedural Knowledge

3. ANS:
 a) $x = 11$
 b) $x = 8$
 c) The equation has no real root.
 d) $x = 6$

PTS: 0 DIF: Moderate REF: 2.5 Solving Radical Equations
 LOC: 11.AN3 TOP: Relations and Functions
 KEY: Conceptual Understanding | Procedural Knowledge

4. ANS:

 $2\sqrt{10}$ units and $3\sqrt{10}$ units

PTS: 0

REF: 2.5 Solving Radical Equations

LOC: 11.AN3

TOP: Relations and Functions

KEY: Procedural Knowledge | Problem-Solving Skills

5. ANS:

a) about -20°C

b) about 342 m/s

PTS: 0

DIF: Moderate

REF: 2.5 Solving Radical Equations

LOC: 11.AN3

TOP: Relations and Functions

KEY: Procedural Knowledge | Problem-Solving Skills

PROBLEM

1. ANS:

Determine the absolute value of each number, then order the results from least to greatest.

$|3| = 3$

$|0.5| = 0.5$

$|1| = 1$

$|1.6| = 1.6$

$|7.6| = 7.6$

$|-3.5| = 3.5$

$|6.2| = 6.2$

So, the absolute values from least to greatest are:

0.5, 1, 1.6, 3, 3.5, 6.2, 7.6

PTS: 0

DIF: Easy

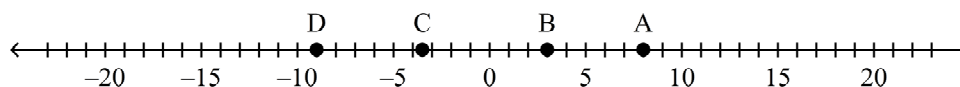
REF: 2.1 Absolute Value of a Real Number

LOC: 11.AN1

TOP: Relations and Functions

KEY: Conceptual Understanding

2. ANS:

Point A: $|8| = 8$, so Point A is 8 units from 0.Point B: $|3| = 3$, so Point B is 3 units from 0.Point C: $|-3\frac{1}{2}| = 3\frac{1}{2}$, so Point C is $3\frac{1}{2}$ units from 0.Point D: $|-9| = 9$, so Point D is 9 units from 0.

PTS: 0

DIF: Easy

REF: 2.1 Absolute Value of a Real Number

LOC: 11.AN1

TOP: Relations and Functions

KEY: Conceptual Understanding

3. ANS:

Write, then solve an equation: $|x - 9| = 19$ Since $|19| = 19$ and $|-19| = 19$ then, $x - 9 = 19$ or $x - 9 = -19$

$x = 28$

$x = -10$

So, two values of x are possible: 28 or -10

PTS: 0

DIF: Difficult

REF: 2.1 Absolute Value of a Real Number

LOC: 11.AN1

TOP: Relations and Functions

KEY: Procedural Knowledge | Communication | Problem-Solving Skills

4. ANS:

a) The length of a leg of a triangle must be greater than 0, so $x > 0$.

b) The Pythagorean Theorem states that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. So, $a^2 + b^2 = c^2$, where the lengths of the legs are represented by a and b , and the length of the hypotenuse by c .

$$a^2 + b^2 = c^2 \quad \text{Substitute: } a = \frac{3}{2}x \text{ and } b = x^2$$

$$\left(\frac{3}{2}x\right)^2 + (x^2)^2 = c^2$$

$$\frac{9}{4}x^2 + x^4 = c^2$$

$$c = \sqrt{\frac{9}{4}x^2 + x^4}$$

$$c = x\sqrt{\frac{9}{4} + x^2}$$

An expression for the length of the hypotenuse is: $x\sqrt{\frac{9}{4} + x^2}$

PTS: 0 DIF: Moderate REF: 2.2 Simplifying Radical Expressions

LOC: 11.AN2 TOP: Relations and Functions

KEY: Procedural Knowledge | Communication

5. ANS:

Use the formula for the volume, V , of a sphere: $V = \frac{4}{3}\pi r^3$, where r represents the radius of the sphere. Sphere

D has a volume of N cubic units.

For sphere E:

$$V = \frac{4}{3}\pi r^3$$

$$3N = \frac{4}{3}\pi r^3$$

$$r^3 = \frac{9}{4\pi}N$$

$$r = \sqrt[3]{\frac{9}{4\pi}N}$$

For sphere F:

$$V = \frac{4}{3}\pi r^3$$

$$6N = \frac{4}{3}\pi r^3$$

$$r^3 = \frac{9}{2\pi}N$$

$$r = \sqrt[3]{\frac{9}{2\pi}N}$$

The radius of sphere E is $\sqrt[3]{\frac{9}{4\pi}N}$ units.

The radius of sphere F is $\sqrt[3]{\frac{9}{2\pi}N}$ units.

PTS: 0 DIF: Difficult REF: 2.2 Simplifying Radical Expressions

LOC: 11.AN2 TOP: Relations and Functions

KEY: Procedural Knowledge | Communication | Problem-Solving Skills

6. ANS:

The side length of a square is the square root of its area.

So, the side length of the smaller square is: $\sqrt{44}$, or $2\sqrt{11}$ units

The side length of the larger square is: $\frac{3}{2}(2\sqrt{11})$, or $3\sqrt{11}$ units

The difference in their lengths is: $3\sqrt{11} - 2\sqrt{11}$, or $\sqrt{11}$ units

Perimeter of shaded region is the sum of 5 times the side length of the smaller square + the side length of the larger square + 3 times the difference in their side lengths

$$= 5(2\sqrt{11}) + 3\sqrt{11} + 3(\sqrt{11})$$

$$= 16\sqrt{11}$$

So, a radical expression for the perimeter of the shaded region is : $16\sqrt{11}$

PTS: 0 DIF: Moderate REF: 2.3 Adding and Subtracting Radical Expressions

LOC: 11.AN2 TOP: Relations and Functions

KEY: Procedural Knowledge | Communication | Problem-Solving Skills

7. ANS:

a) The area of the large square is 112 square units.

So, the area of each small square is: $\frac{112}{16}$, or 7 square units.

The inner square has the area of 4 small squares: $4(7) = 28$

The area of the inner square is 28 square units.

b) The side length of a small square is the square root of its area: $\sqrt{7}$ units

The perimeter of the outer square is equal to 16 times the side length of the small square:

$$16\sqrt{7} \text{ units}$$

The perimeter of the inner square is equal to 8 times the side length of the small square:

$$8\sqrt{7}$$

$$\text{Difference between perimeters: } 16\sqrt{7} - 8\sqrt{7} = 8\sqrt{7}$$

The difference between the perimeters of the outer square and the inner square is $8\sqrt{7}$ units.

PTS: 0 DIF: Moderate REF: 2.3 Adding and Subtracting Radical Expressions

LOC: 11.AN2 TOP: Relations and Functions

KEY: Procedural Knowledge | Communication | Problem-Solving Skills

8. ANS:

$$(2\sqrt{3} - 2\sqrt{5})(-2\sqrt{3} + 2\sqrt{5})$$

$$= 2\sqrt{3}(-2\sqrt{3} + 2\sqrt{5}) - 2\sqrt{5}(-2\sqrt{3} + 2\sqrt{5})$$

$$= -12 + 4\sqrt{15} + 4\sqrt{15} - 20$$

$$= -32 + 8\sqrt{15}$$

PTS: 0 DIF: Easy REF: 2.4 Multiplying and Dividing Radical Expressions

LOC: 11.AN2 TOP: Relations and Functions

KEY: Procedural Knowledge | Communication

9. ANS:

Use the formula for the area, A , of a rectangle: $A = lw$

Substitute: $l = \sqrt{11}$ and $w = \sqrt{7} + 6$

$$A = lw$$

$$A = \sqrt{11}(\sqrt{7} + 6)$$

$$A = \sqrt{77} + 6\sqrt{11}$$

PTS: 0

DIF: Easy

REF: 2.4 Multiplying and Dividing Radical Expressions

LOC: 11.AN2

TOP: Relations and Functions

KEY: Procedural Knowledge | Communication

10. ANS:

Since $4x - 7 \geq 0$, then $x \geq 1\frac{3}{4}$

Since $-2 + 5x \geq 0$, then $x \geq \frac{2}{5}$

So, for both radicals to be defined, $x \geq 1\frac{3}{4}$

$$\sqrt{4x - 7} = \sqrt{-2 + 5x}$$

$$\left(\sqrt{4x - 7}\right)^2 = \left(\sqrt{-2 + 5x}\right)^2$$

$$4x - 7 = -2 + 5x$$

$$-x = 5$$

$$x = -5$$

Since $x = -5$ does not lie in the set of possible values for x , $x = -5$ is not a root of the equation.

PTS: 0

DIF: Moderate

REF: 2.5 Solving Radical Equations

LOC: 11.AN3

TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge | Communication